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*Containing the Papers read before the Society during the
Thirty-First Session, 1909-1910.*

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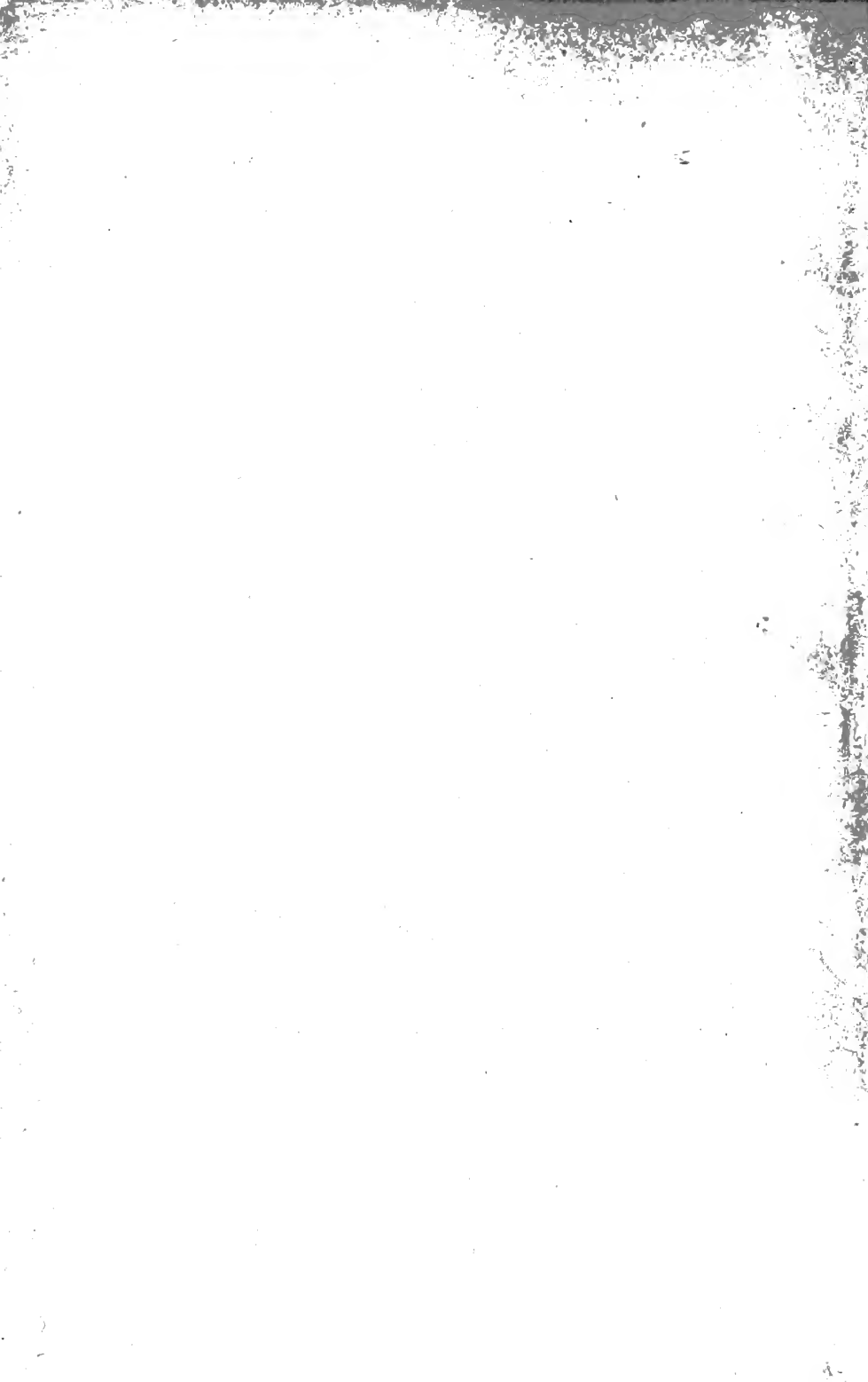
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PAPERS READ BEFORE THE SOCIETY, 1909-1910.

I.—ON SENSATIONS AND IMAGES.

By S. ALEXANDER.

Preliminary and Explanatory.

I BEGIN with certain preliminary remarks, designed to prevent misunderstanding. They are suggested by Mr. Stout's paper,* which I do not propose to answer directly, but by what I consider the more satisfactory method of carrying my inquiry a stage further in view of acknowledged difficulties.

(1) The method of description which I use is apt to be misunderstood. It consists simply in the attempt to exclude philosophical presuppositions, and to state what is actually present in a given experience, so far, of course, as that experience has characters of metaphysical significance. The "object" or "thing" described will have different characters according to circumstances. Thus, if there is a green leaf before my eyes, the object may be merely the sensation green, or it may be the quality greenness, or, to go a stage further in description, it may be the permanent thing called a green leaf with all its characters of extension, colour, and the like. The description now includes thinghood in the proper sense. But nothing enters into the description which is not present in the experience as its contents. Hence, while it may be very

* "Are Presentations Mental or Physical?" *Proc. Arist. Soc.*, 1908-9, pp. 226 *fol.* I shall refer to this for shortness by the writer's name alone.

important to discriminate in a given case between what has been called the content and the intent, the intent is for description another and special part of the content. Such a method is open to the difficulty that it proceeds slowly and begins with very simple and general description. But it will not overlook in its proper place any genuine element of what can be observed. For instance, it is plain that the object of sense-perception is saturated with interpretation. This raises no difficulty for the method, but it raises a serious problem, if, as I maintain, the first result of the method is to declare that the object of sense-perception is never mental but external. How, in that case, can the interpretation which is supplied by the mind be, as it is, a constituent of the object? This is one of the questions upon which I hope to throw light.

(2) As analysed by this descriptive method, a perception, say the perception of a tree, is resolved into the fact that there are two things, the act of perceiving, which is consciousness, and the external or physical thing, tree. This analysis is misunderstood to be an appeal to common-sense, and the same thing is, I suppose, intended when it is described as naïve realism.* By naïve realism is meant the bare assertion without evidence, or the assumption that there is an external thing of which we are conscious. But the descriptive method makes no assumption, and is therefore not naïve realism. Nor does it appeal to common-sense, which, as Mr. Stout rightly says,† has never entertained the question at issue, and cannot therefore furnish an answer. The doctrine is, indeed, as remote as possible from common-sense, and it demands some effort of thought and imagination, at least on my part, stoutly as I uphold its truth, to keep the truth in question from slipping away from me. The appeal cannot be to introspection, for introspection informs me only of myself as the act of

* F. C. S. Schiller, "Solipsism," *Mind*, No. 70, pp. 178, 179.

† Stout, p. 229.

perceiving; it is extrospection which informs me of the tree. The appeal is neither to unexamined assumption or faith, nor to common-sense, nor to introspection. There is no appeal, for none is needed. The experience, "I perceive a tree," is the statement that there are two existents, the percipience or consciousness and the different and therefore non-mental thing the tree. The fact that these two things exist together is a statement precisely of the same character as that there are two existents, the tree and the grass in which it stands, the only difference being that one of the two things which are together is conscious. Leave out of account for the moment the complexities of the character of the object tree and the subject I, and this is the simplest statement of what the experience "I see a tree" itself attests, so long as no philosophical presupposition intrudes. Directly you say that because I am conscious of the tree, there is therefore some dependence of the tree on me, you are introducing something which, even if it should prove true, is not contained in the given experience as such. Steadily exclude traditional or untraditional philosophical notions, and you find nothing but the togetherness of the two existents mentioned. When I myself go on to say that the particular act of consciousness is evoked by the action of the tree on my bodily senses, this is added theory, and is not contained in the given fact, but inferred from it.

If anyone chooses to call this doctrine a paradox, I should not complain. To call it common-sense is to have failed in stripping oneself sufficiently of customary learning to realise the full, and if you will paradoxical, simplicity of the given fact.

When I say that in perception an object is revealed, I do not mean, as is suggested,* that a veil or screen is removed from it. The word is taken from religion where it is used to describe knowledge which is not discovered by the

* Stout, p. 237.

human mind, but is conveyed to it from some mind outside and superior to it. There is no implication in my use of the word of any mind as the source of external objects. But I speak of these objects as revealed, in order to indicate their externality or non-mentality. I can find, at present, no better word.

(3) To every object of which there is consciousness there corresponds some mode or affection of consciousness. What I have asserted, proceeding as I think on the basis of description and not on the basis of theory or argument, but of simple observation, is that these modes of consciousness have no quality-differences. I treat them as modifications of mental activity varying subtly with each object. At one time, if I may be allowed the apparent egotism of relapsing into the history of my own mind, I entertained the hypothesis that there might be qualitative thrills of consciousness; that we might feel a blue thrill or a green thrill, or a sweet or a fragrant thrill, much as we feel a thrill of pleasure or pain; but I abandoned this hypothesis because it left no way open to the understanding of objects. But needing now, with better reflection, to describe these non-qualitative differences of consciousness, I describe them as differences of direction. This terminology is connected with certain statements which I do not withdraw, but the fuller treatment of which I must reserve for some later occasion, when I can again discuss the relation of consciousness to the body, and what I should now speak of as the two meanings of the self, as subject and as person. Meantime I am content with the statement that the varieties of cognitive conation are non-qualitative.

In reducing mind to conation and feeling, I denied the existence of presentations. In doing so, I had in mind presentations of an objective character, such as commonly go with a doctrine of representative perception. I had not in mind presentations in the sense in which Mr. Stout uses that word. In this sense, presentations are not modes of cognition, if by this is meant the mental act or state of our being aware

of something in distinction from the something of which we are aware; in which case they would be equivalent to or covered by my non-qualitative modes of consciousness. Nor are they specific qualities of conation or attention, those supposed thrills of conation to which I have alluded. They are a class of psychical existents, experienced as conations and feelings are experienced; and they, being immediate experience, "specify and determine the direction of thought to objects transcending immediate experience."* "They form with conation and feeling part of the single system which we call an individual mind."† It is an uncommon advantage to me to have the issue as between myself and Mr. Stout raised thus explicitly. But I find insuperable difficulty in realising these mental existents to myself, and I cannot regard the arguments for them as cogent. I have suggested an alternative. And the best way of procedure is for me to make clear that the difficulties which he believes make my account unworkable are capable of another interpretation. The two alternatives are these:—On one view there are besides physical things and mental conations, also mental existents called presentations as defined; on the other view there are only mental activities and external objects, and on this view it is held that there is nothing to correspond to presentations, but on the one hand modes of conation, or on the other modes of external objects.

(4) In maintaining that all objects of our cognition were physical, I went beyond my record. I was engaged with the cognition of physical objects and omitted such objects as numbers, for instance, which it would be dogmatic at present to call physical. My purpose was to indicate that the objects of cognition were non-mental, and that would have been enough for clearness. The vital question is whether they are independent of mind; and to indicate this I shall use the term

* Stout, p. 246.

† Stout, p. 241.

* non-mental or else external. At the same time it will, I hope, become clear that (in the case of physical things) sensations, images, etc., that is not seeing or imaging, but *sensa* and images, are physical. I do not think there is ground for complaint* that no definition was given in advance of the physical or the mental; the very object of the inquiry being from one point of view to determine precisely how much is included under either designation. It helps little to say that physical is whatever is or essentially belongs to physical things as understood by common-sense. For instance, are we to say that no two physical objects can occupy the same space, which would immediately exclude colour and taste, which may occupy the same space, from being physical, or only that two physical bodies cannot?

(5) Mind has been described on the strength of the method as consisting of acts of consciousness. This might be misunderstood to mean that consciousness was a pure activity floated off by itself in disconnection from matter.† The acts of consciousness in question are of course thought of as functions of the body. It was even explained that the consciousness was, by its own witness, located in the body.

In pursuing the method, I have done little more than sketch an outline, and many topics have been left over which seem, at first sight, inexplicable. I propose to address myself to the most obvious of these difficulties:—

(a) The familiar facts, known sometimes under the name of the relativity of sensations, which are commonly taken to imply that sensations are mental.

(b) The nature of images and the assertion that they are non-mental.

* Stout, p. 226.

† Mr. Wolf's article on "Natural Realism" in *Proc. Arist. Soc.*, 1908-9, § 13, pp. 163-5.

(c) The problem of how the mind can interfere so as to interpret or distort things (*supra*, p. 1).

It will be found that these three topics cannot be kept entirely apart from one another.

Sensations.

The proposition maintained is that sensations are non-mental. It will be convenient to repeat one distinction and to add two others. The repeated distinction is that between the sentience and the *sensum*. The sentience is mental, but it is held not to vary in quality. The *sensum*, which I shall commonly call sensation, is non-mental. The other distinctions are (1) that between the appearance and reality, and (2) that between illusion and reality. These two distinctions do not coincide. Appearance is contrasted with reality as part or aspect with whole. An appearance is a reality though not the whole of the reality of which it is said to be an appearance. An illusion is not a reality, or, in order to anticipate a little, it is not the reality which it purports to be. With these preliminaries I may proceed.

The general principle of interpreting the varying and perplexing information of the senses follows easily from the method employed: *i.e.* from considering the relation of mind to its object as merely a particular case of any two objects related to each other. Take the effects which a physical body produces on another physical body. The first body remaining the same, its effects will vary: first, according to the conditions which surround it, and, secondly, according to the constitution of the affected body. A body will affect a photographic plate in the sunlight but not in the dark. A squirt of water will drench a body, or barely touch it, or not affect it at all, according as the squirt is one, or two, or three yards distant from the body. In these cases the first body actually undergoes a difference in relation to the second. But there is a second class of cases. A steel point will scratch lead but make no impression

on a diamond. A ball will bury itself in sand but rebound from a wall. The pressure is the same but its effect is different, because of the response of the patient. Now, suppose the patient to be a conscious body. The external appearance revealed to the patient will be different, either if the stimulus acts under conditions which alter the stimulus, or it will be different according to the character of the organisation. In the first kind of cases, the different appearances are all actually present, and there is no error. In the second case, some of the appearances, while remaining external, may be illusory. Which appearance is true and which is false will depend on whether the instrument which receives the revelation is fitted to receive it or not. In many cases there is no error but only defect, either want of apprehension, as in stimuli below the threshold, or inability to apprehend difference of stimuli, as in the case of the colour-blind.

Let us begin with the latter class of cases, taking in particular the cases of perfectly normal variations, which are therefore ordinarily, with much plausibility, treated as meaning that the sensed appearance must be mental. On the periphery of the eye, colours disappear and are replaced by shades of grey. The periphery is a defective instrument in respect of colour. The colours exist in the object, but are not revealed to the eye at the periphery. The only visual revelations are those of brightness. If our eyes were all periphery, as they are in the exceptional cases of totally colour-blind persons, we should never know of the existence of colour. Similarly, what is red at the centre of the eye changes to a yellow at the intermediate zone of the retina. This zone of the retina does not distinguish colours with sufficient fineness. We know this to be a defect, because we have in the centre of the eye a more perfect instrument. Here, as in the former case, some real appearance is revealed, but, so far as red is confused with yellow, the full "subtlety" of nature is not revealed. What normal persons are in respect of this region of the eye colour-blind

persons are habitually. Whatever colour it is that such persons see, their defect is that they do not apprehend two colours as distinct which are distinct to the more perfectly and appropriately endowed individual.*

Considerations partly the same and partly different are introduced by the familiar case of the water which appears at the same time hot and cold to the two hands respectively. In respect of the two hands, the sense organ is different, for the physiological zero has been raised or lowered in the two cases by dipping the hands in hot and cold water respectively. If we treat the two sensations as differing only in degree, we must remember that degree can only have reference to some point from which the scale is reckoned. This being so, the water not only is *felt* but *is* hotter to one hand and colder to the other; and this is the only meaning of the supposed contradiction, which is no contradiction. If we consider the difference of hot and cold as a difference of quality, the case is the same as the varying quality of the sensations which the same object may produce in different individuals. The meaning of this familiar fact is that individuals with different senses apprehend differently. The *sensum* revealed is still non-mental, but it is only to the appropriate sense-organisation that it is revealed without defect or error. It is, of course, the variation of the

* Whether we are to regard failure to appreciate difference of stimuli as being erroneous from defect or as total error raises problems which I do not wish to discuss at present. When two degrees of loudness are heard as identical, it seems most natural to say that part of the louder degree is heard but not the remainder or the whole. Colour-blindness is more difficult. Luckily, the difference of colour theories does not concern us. Whether there is missing the red-green substance and the patient sees a yellow or blue, or only the green substance, say, is missing and he sees red and green as red, there still remains the theoretical question: is the colour which he sees, whatever it is, actually a part of the physical stimulus, or is it wholly illusory? In the first case, there is a defect, that is of apprehension of difference. In the second case, there is complete error, the patient's organisation falsifies the revelation. But neither interpretation affects the general interpretation given above, but only the interpretation of this special case.

sense-appearances to different persons, or to the same person at different times, which leads us to set up, more particularly in respect of scales of degree, but also in respect of qualities, artificial scales like that of the thermometer, which are relatively independent of the interference of the sensuous organisations of persons.

The specific energy of the senses means that the sensation is the same, however disparate the stimulus. Consequently, when the eye is struck we see light, though there is actually no excitement by light, and when a cold point on the skin is stimulated by a piece of hot metal we feel it cold. The meaning of this fact is that to each kind of external object there corresponds a particular reaction on the part of the instrument, by which the revelation is received. When the mind is set going in that manner, is set to work in that direction, the corresponding non-mental object is present. When the stimulus is disparate, the object presented is illusory, but it does not cease to be external. The illusory character of the appearance is the defect of our quality. With an organ adapted to see red we can see only red, no matter how the organ is set a-working. How it is possible that under such conditions there should be an external and illusory object present, raises a metaphysical question which I defer till I speak of images and their external character. It will then be clearer that the paradoxes connected with the specific energy of the senses are but the price we pay of a little error for the sake of a great deal of truth; and that, instead of disproving the general interpretation which is here advanced, they confirm it.

I pass to the cases where difference in the appearance arises from change in the situation of the stimulus without necessarily carrying with it error. Such are the cases of the stick bent in water, the intersection of parallel lines at a distance, the diminution of the visual magnitude and in some cases the alteration of its colour as it recedes. Here the visual characters of the object are altered by the conditions which surround it.

There is no disturbing affection of the perceiving organ. The visual instrument is not altered, as it might be if provided with spectacles. Look at a stick through a transparent tank of water, and it still looks straight. The stick itself must be partially immersed in water. Nor is it enough to say that what we see is not the stick itself, but the stick and the water. We need not notice the water. The fact observed is simply that the same stick looks straight in air and bent when half in air and half in water. The bending is the appearance of the stick, and it is not even an illusory one. The stick's *visual* character changes. The stick under these circumstances has the same visual character as a bent stick in air, and for a well-understood optical reason. There is illusion only if we deny that the bent and the straight appearance in the two different sets of conditions belong to the same stick; or if we were to say that the stick which is bent to the eye is bent to the touch. But it is true that the occasional discrepancy of vision and touch and the varying deliverances of vision confirm us in the belief in the more primary character of the appearances as revealed to touch. Similarly, there is no illusion in seeing the mountain blue in the haze, but only in thinking that it is also blue without the haze. Again, the *visual* magnitude of objects is really affected by distance. This only seems paradoxical if it is forgotten that magnitude is a matter of comparison, that there is more or less of it in reference to the standard which is the zero. A line a yard long looks half a yard at a certain distance; but the yard measure by which we measure it would at the same distance shrink to half its apparent length and still cover the given line. Two rails with a 4 foot 6 gauge meet to the eye. At the same distance a 4 foot 6 rule would also vanish to a point. The distance being constant, magnitudes retain their proportions. Under the microscope, a blood-corpuscle looks a quarter millimetre broad, but the millimetre scale is enlarged to sight in the same proportion. What these facts do teach us is that, taking touch extension as primary, we come by experience to correlate

the varying visual characters under their circumstances of distance and surroundings with the tactual extension. But it is always the same real occupation of space which reveals itself in these various ways to touch and sight.

By way of throwing light on these problems, I will make two ridiculous suppositions and ask what would happen if they were true. Suppose, first, that all ordinary objects had first to be half immersed in water before we could see them, carried about with themselves transparent bags filled with water which extended half-way up their length. And suppose next that we could only see things when they were removed at least a hundred yards. The laws of optics are supposed unaltered. In the first case, straight sticks would look bent, and sticks bent to a proper angle straight. In the second case we should look microscopic to each other, and feel between five and six feet high. In the first case there would be an embarrassing discrepancy between the language of touch and sight. In the second case we should learn to co-ordinate our minute visual pictures with tactual ones as we do now, and should say we saw a man five feet or six feet high. But our eyes would be useless except for moderately large objects. I imagine that the result of natural selection in such a world would be to furnish us in the first case with eyes which would twist the visual appearance, and in the second case with eyes of a proper magnifying power.

Where the surrounding conditions affect not the object itself but the organ, there is inevitable distortion and illusion. Such is the case of the candle-flame seen double by pressing aside one eye or arming it with a prism. The distortion of the object consists here not in any mistake in its own features but in its dislocation in space. With both eyes open the candle is seen by the abnormal eye in a different place from the same candle as seen by the normal eye. That there is only one real candle is shown by closing each eye alternately, when each appearance can be touched in turn. It is in reference to

the place as seen by the normal eye that the other percept is displaced, and regarded as illusory so far. The illusory percept is seen in its place for the same reason as a disparate stimulus is sensed as the appropriate sensation. But the further treatment of the external character of both this and the percept of the normal eye is better deferred to the next section.

For the same reason, I do not deal here with such normal illusions as the familiar illusions of geometrical figures. In all these there seems to be an element of interpretation whatever the source of the suggestion may be.

It is therefore necessary to make clear that images are external.

Images.

Imagination, whether reproductive or constructive, has certain features which distinguish it from the corresponding process of perception, which features it is the business of psychology to expound. In particular, memory differs from perception in its relative incompleteness and inaccuracy, and in the possible introduction of new features not present in the original. This character I omit for the moment, because it is the subjective element in images, and I do not wish to complicate the question. It is the subject of the next section.

The imaging of an external or physical thing is of course mental. What is here maintained is that the image itself is non-mental, or external, or I am prepared to say physical. The truism or paradox which I advance is here at its acutest, because an image is entertained in the absence of the object perceived. In calling it external, or physical, I mean that it has the characteristics of physical objects. The village of Headington, where I once lived, is present to me in all the form and colouring of the original. It is in three dimensions, and I imagine myself walking down its street, and hear the greetings of the children. In dreams the object which I see I can also touch in dream and experience the same resistance

as I should were I touching it sensibly with my hand. But this statement provokes at once an objection and a question. The objection is that while I can think of the *physical* street I imagine only its *image*. In other words, the content of the image is only mental, but it may direct me to the physical object which is thought of. I have already alluded to this matter.* The contents of the image are here characterised by thinghood. It is true that not everything enters into an image which requires the action of thought. When thought enters, the content of the thought is present as well, and in the same sense as the content of the image is present. That thought, as distinguished from the mental act of thinking it, is also non-mental, but it is different from the mere image as such. I suppose that it is this which is really at the root of the controversy between Mr. Stout and myself, and makes us seem to be at cross-purposes. I think of a thing in its absence. There then arises the question referred to, how can I image, or think, (or perhaps I may add in view of what was said above with respect to disparate stimuli) sense, objects in their absence? This is the metaphysical problem to which I must address myself.

If we start from imagination, and especially if we start from constructive imagination, it is impossible not to be impressed with the spectacle of our mental or personal activity, and we naturally think of images as mental products; and proceeding to perceptions, we go on to treat sensations and percepts, and I should add thoughts, as mental too. But if we begin as I do with perception, we analyse it into the togetherness of the mind and some non-mental thing or object which is revealed to the mind. When I face a table and it stimulates my body in a certain way or evokes a certain form of mental action, the table is revealed to me in perception. When I turn my back, the table no longer evokes that form of mental

* See p. 1.

action and I no longer have the percept of the table. Suppose now that, for some reason or other, it may be by a process of association, it may be by some chemical stimulus, the brain and the mind with it are set going in the same or a similar fashion, and I image the table, that experience is an experience of the table in precisely the same sense as in perception. While before the experience meant the togetherness of the mind as perceiving and the percept table, so now the experience means the togetherness of the mind as imagining and the image table, equally non-mental. And in both cases the fact is avouched by the experience itself. Fully realise that perceiving a thing means that mind and the thing are together in the same sense as the table and the floor are together, and you understand that the imagination of the table means that the mind and the table are together; but the table in its imagined form, with imperfections and added elements. The mental action has been evoked in the two cases by different means: in the one case by the direct action of the object, in the other indirectly. I put aside the question whether the brain processes in perception and imagination are the same in kind and different only in intensity, or are separate processes of which imagination is the outgrowth of perception. It is at any rate continuous with it. There is identity enough to account for the identity of the objects, and difference enough to account for their differences. By togetherness I mean copartnership in one universe. I am ready to substitute the more elegant and convenient word *compresence*, provided that it is understood without reference to time. It must not be taken to mean coexistence in time with the act of apprehension. Clearly the object remembered is prior to the memory of it, and it may have ceased to exist before we remember it. But equally, a sensation, that is a *sensum*, is prior, on my showing, to the sentience of it, and by a measurable interval. In this sense all sensation is of the past, is, to use an inaccurate expression, memory. But I do not pursue these


topics, partly because it is not necessary for my present purpose, partly because I have no present clear answer to the difficulties as to the nature of time which they suggest; I mention them only to show that I am not unconscious of the problem.

The difference between perception and memory may be illustrated by a comparison. In perception we are in face of an object. Memory or imagination is like turning us round when we have our backs turned. When we are thus turned round we cannot but see, and what we see is the same object as before. This is only a simile. In imagining we are not turned round. But we become aware of the object with which we are together, or compresent, in the one universe, in the form in which it can be presented in imagination. It is convenient, especially for a visualiser like myself, to take advantage of this comparison with the action of turning round so as to see. I can say, therefore, that in all our experiences there are on the one side the various acts of experiencing, differing with each appearance of objects, and on the other side objects appearing of which we have vision, a vision which is limited or comprehensive according to the mental action which is engaged. But always the vision is of something not ourselves, non-mental. Absence in time or distance in space is no bar to this vision of things.

But it will now also be clear why images of physical things are not only non-mental but also are themselves physical. The memory of my friend is a physical appearance of a larger and completely physical thing, my friend: blurred indeed by time, like all memories, and falsified perhaps by my personal interpretations and interests. He may no longer exist. Does he cease to have been physical because he has ceased to exist? Remembering him is not physical. Neither is dreaming physical. But the dream-appearance is physical. Physical is what has physical properties. Mental is what has mental properties. One physical property is to be in space. The dream appearance is in the dream space and that space is the

space which we live in, but seen in a dream. Dreams are full of illusion, and so far they are not true and are not verifiable. But in the dream space bodies do move and attract inversely as the square of the distance, so far as they are dreamt of as doing so, just as in waking life they are thought of or present themselves to thought as doing so, and doing so independently of the thinker or the dreamer. Whether Mr. Stout sees this statement, or only "pleases to dream" that he sees it, the statement is the same and equally physical. This is, indeed, not the language of common-sense, to which it would be unmeaning, and it may even seem to some to be the language of madness. But it does not appeal to common-sense but to fact.

Imagination is continuous with perception and grows out of it. The image and the percept are the same contents or, as I prefer to say, the same objects appearing in different forms. The one is physical in the same sense as the other. Hence the image of memory or imagination is tested or verified by reference to the percept. There is good reason for the pre-eminent use of sensory objects as standards. For in sensation the object acts directly upon our bodies. But if it is true that images are continuous with sensation it is no less true that sensation is continuous with images. For sensory experience is enlarged by imagination and anticipated by it. It is in this interplay between sensation and idea that the distinction of images and perceptions becomes established. Both to sensation and to imagination, objects are revealed as objects with certain characters. But when images fail to be verified they are distinguished as being only images. And it is in this way that we come to correct one part of our experience by another; and to acquire a body of truth, by the use, on the one hand, of successful dealing with sensible objects, and, on the other hand, of the thwarting of personal or preconceived expectations by contact with sensory fact. Practical necessity and disappointment are thus the two means by which the spirit leads us into truth. But this process implies, or can at least be



† explained, if we hold that in our various mental actions it is physical things which form the contents of our minds, or the objects of those mental actions, differently presented according to the circumstances of our minds, but the same things continuously brought within the ken of our vision.

Subjective Elements in Experience.

Imagination is thus as much a vision of physical things as perception or sensation. In both cases the mind declares the togetherness of itself and the object. Only in the case of images, the central action is provoked not by the object itself but internally by some other mental, that is cerebral, excitement. No difficulty is now offered by the association of ideas, which might otherwise be unintelligible.* The principle of association is, shortly, this. The mind on some occasion has been set going in a complex of activities, which are also brain activities. When, on some later occasion, one part of the complex is re-excited, say by some sensed object, the remainder of the complex is re-excited, and its corresponding object is revealed, in image. From this point of view, the question whether it is mental events or objects which are associated becomes indifferent. Both are associated, but if a choice must be made it is the events, *i.e.* the mental actions, which are more strictly so described. The value of the famous saying that association marries universals is that it is the type or scheme of mental action, forming thus with another type or scheme a total scheme of action, which is the fundamental feature in the process. In other words, for association it is indifferent whether the suggesting object is precisely the same as before or not.

In getting to know the world of which we are a part we depend on two factors, the direct action of things outside us upon our bodies, and our own mental actions which bring us


* Stout, p. 246.

face to face with things not-ourselves. The object is always impersonal, but by our own personal action we are continually receiving impersonal revelations. Association of ideas comes suitably under this head because it is by personal expectations so produced that we anticipate sensible experience. But it is but one case of the all-pervasive principle of interpretation. Things are saturated with our suggestions and inferences, varying from fully conscious suggestions to sub-conscious ones. These interpretations come from us, but they form part of the object itself. The meanings of things are not merely something which we entertain, but apart from the question whether they are correct or not, they are part of the constitution of the things and we act on that understanding. How they can be, as we loosely say, supplied by the mind requires no further explanation. The difference between what is revealed in sense and what is added in interpretation is solely a matter of the method of the revelation. We are always by one method or other seeing things themselves, or, to vary the metaphor, handling or manipulating them. This is true even when the suggestion is unconscious. We treat the object as possessing certain added characters corresponding to the unconscious mode, whatever that may be, of the mental activity, which characters are fully revealed if the activity passes into clear consciousness. Nay, the suggestion may be a totally unconscious one, a mere state of our body, and affect our reaction upon the object.

The best illustration is to be found in the difficult and subtle facts of un-understood nascent desires which impel us to the pursuit of their appropriate object. At first the desire is felt for something or other, we know not what, and we are aware of a certain class of objects as surrounded by a dreamy halo of possibilities. When the object which is suited to gratify the desire comes within our sensible vision, the real and proper object of the desire becomes, from vague, definite and filled with detail.


It is but a step from this to constructive imagination or

hard thinking of a hypothesis, the most obviously subjective of all our mental processes, and where it might seem most paradoxical to assert the revelation of an external reality given as the contents of the experience, though not necessarily exhausted by them. The creative impulse, backed in imaginative production by passion, and in scientific invention by more or less warmth of curiosity, squeezes out the result from our minds; working in complex wholes of mental activities, in view of the materials which correspond to those activities, modifying these complexes by here a touch added and there a touch removed, till by a sort of intra-mental natural selection that complex is arrived at which satisfies the creative impulse. In all this labour of expression the mind is still handling outside objects, using the materials of its experience and building them into a new structure of art or science. Whether some totally new feature of things may thus be discovered is a question which I need not raise for fear of accumulating difficulties. But it is always external materials that are being handled, and the new product is itself, whether it is a statue, or a poem, or a thought, also external and presented from without. It is well known that discoverers or creators themselves describe their works as coming to them from without, which we are in the habit of ascribing to their personal powers. This humility of great men is prompted by their sense of what is literally true. Scientific discoverers, to take their case more specially, who proceed by the invention of hypotheses, are minds so gifted as in response to the world to body forth from their own minds imagined or conceived combinations which are afterwards attested by sensible things.




I have taken extreme cases, but I need not pursue these difficult, and perhaps dithyrambic, flights in order further to elucidate the commonest feature of our mental life: that in the learning of the world there is this constant interplay of mind and things, that we discover in things such wealth of

properties as our minds are fitted by nature or previous experience or happy particular endowment to appreciate. What to the empty mind is a bare colour or taste is to another full of meaning, is symptomatic or significant. The mobile intellect of one apprehends what the dull wits of another can only perceive after demonstration by the discoverer or not at all. But the stores of experience which the mind brings with it to the apprehension of things are themselves non-mental and physical, and the mental actions themselves are but instrumental. And I repeat that, in seeing or manipulating things, the mind is but declaring that these things exist together with itself or are copartners or compresent with itself in the universe to which both mind and things belong.



It is, we have seen, because in our various mental actions we are handling or are in view of the same physical object that we are able to connect sensory and ideational appearances of things, experiences which are themselves physical, though all partial, into one connected and continuous whole which we call the thing whose appearances are thus revealed. We may now add that it is just because it is physical, non-mental appearances that we handle or see that different individuals can collate their different experiences of the same thing. They can do so because the appearances which they apprehend are in all cases external to all the minds alike. Each mind may see different appearances. We see things from a different angle, partly because we are literally in a different spatial position with respect to them, partly because the different history and aptitudes of our mind dispose us to see things differently, so that a different selection from the fulness of the object is revealed to us. Each of us has his own special interpretation of things. But since our perceptions, images, ideas, notions are physical appearances of the same physical thing, I can control my ideas and sensations and the rest by yours. In this way we arrive at true or scientific knowledge. The result of intercourse of different persons with one another



is to depersonalise the world of individual experience and give us truth.

Personal Elements in Experience. Illusion and Error.

We must distinguish, next, between the mental or subjective and the personal elements in knowledge. All knowledge that goes beyond the purely sensational stage depends in the manner explained upon the character of the instrument. But we need a word to describe the special ways in which the special features of the instrument, and consequently the objects which it indirectly brings to view, determine the appearance which is revealed. These special features of the instrument I may call personal, in distinction from mental or subjective. I call them personal because in the end they rest on congenital or acquired dispositions of the body or in particular of the brain. But they are of two kinds. The first kind are helps to knowledge, and indeed the necessary means of acquiring it; the second kind are hindrances, and are the source of illusion and error.

The first kind are those which arise from our different situations, in virtue of which things present to us their different sides. The table presents one corner to you, another to me. Both corners are actual, and if I put myself at your place I shall see your corner. These are the merely individual differences which are collated to form fuller knowledge of the object. It is particularly the work of thought to take the scattered appearances of things, whether in my own experience or in the experiences of several individuals, and use them so as to connect them into a whole, or, better, so as to gain the vision of the whole. The particular appearances remain true, but thought discovers their unifying and explaining law. Science depersonalises in this sense by reducing the desultory and disconnected into continuity and coherence. Each appearance, though personal so far as it is vouchsafed to a certain individual, contributes to the common knowledge, and

at the same time is intelligible to other individuals. This familiar state of things may be compared to the use of language. Each person uses his own turn of phrase and his own intonation. But each is intelligible to all the rest, provided he speaks within the limits set by the genius and the usage of the language. The language exists as the common body of ordered expression, which passes between such persons who speak it correctly. It is impersonal only in the sense of being more than the work of any one person. Thought is in this sense impersonal.

But if the speaker uses words or phrases incorrectly, or introduces falsetto into his speech, he is an eccentric, and the correct use of language rids persons of this mistaken habit, which renders them unintelligible, and their speech incommunicable. The personal features in acquiring knowledge, which correspondingly are excluded and not used, are ignorance or defect, and illusion and error. Strictly speaking, ignorance and mere defect, whether the defect is the absence of a sense, as in deafness, or the inability to appreciate difference, as in colour-blindness, are on a different footing from illusion. For the absence of certain appearances need not falsify the rest, and what a person knows (say about the moon) may be true, though he has not the whole of lunar theory. (This may at least be accepted provisionally.*) Illusion arises in such cases, and it generally does so arise, so far as a person takes his defective knowledge for complete, and believes that green and red things have the same colour. So far as this is the case, science and education seek to remove the disability, if they can. Strictly speaking, illusion and error arise when there is not merely defect, but incongruity between the object actually present or intended, or supposed to be present, and its appearance, so that the appearance is not a true appearance. Illusion may perhaps again be distinguished from error by its

* See later, last section.

unconsciousness. The picture seen in the stereoscope seems solid; this is only an illusion, for we do not suppose we are looking at an actual solid thing. If we do we are in error. There is something of pretence about error in the strict sense, the person in error is self-deceived.

These minuter distinctions do not, however, concern us here. Let us use error generally. Wherever it occurs it is due to the intervention of the personal factor between the mind and the object. It occurs wherever some objective appearance is presented to the mind which does not belong in fact to the object intended. The question then is how, if all objects are non-mental, physical, is illusion possible?

The answer is that everything which is illusory in the illusion does actually exist in correspondence with the mental activity through which it is revealed, but that the personal character of that activity dislocates the real object from its place in things, and refers it to a context to which it does not belong. When I fancy a horse's body and complete it with a man's head, the head exists in reality, but not upon a horse's body. When hot metal touches a cold point of my skin, and I feel it cold, it is the coldness of a cold thing which I feel; there is illusion, so far as I refer the coldness to the metal touching me which I see, or, if we prefer, supplement the cold sensation which I really feel by the touch and other properties of the metal which is touching me. When my eye is struck and I see sparks, I see physical and sensory light, but displaced to the points of space in which I see the sparks. There is further misinterpretation in supposing them to be sparks. When I see the plane figures solid in the stereoscope, it is not the solidity which is illusory, but again the supplementing of it by the other physical properties of the scene depicted. In the same way, the painter produces the illusion of a man actually present by suggesting the properties of his subject which he does not paint, but which really belong to the subject. To multiply examples would only be to repeat the

pages of works of psychology which describe illusions. Intellectual error exhibits the same features of taking up or seeing real and actual parts of the world, and repiecing them together into combinations determined by the inappropriate character of the total complex of mental activity. An erroneous proposition always deals with actual realities, but it pretends that one actual reality has a property which is also real, but belongs to some other actual object. In other words, error arises not from unreality, but from misdescription.

Let it not be supposed that, in speaking thus of real sensations wrongly connected with other objects, I am treating a sensation or other appearance as something that may be floated off, and can exist in independence of its substantial basis. On the contrary, the cold sensation which is felt by the cold point of the skin when excited by a hot body is a sensational object precisely of the same sort as we experience in a cold body that acts upon the skin. That body itself is a more or less complete continuity of its own appearances, and the cold felt is in both cases cold belonging to a body. What is meant is that, owing to a visual obliquity of the mind, two sets of physical appearances are wrongly correlated, much as in actual bodily vision when you look with the two eyes at an ink-spot on the window you may see a chimney-stack and a church-spire in the same place.

Error therefore involves the same metaphysical difficulty, and is explained in the same way as constructive imagination, and for that matter memory also, so far as it involves, as it does, construction as well. In imagination we take pieces of our world and put them together into new combinations. Sometimes these combinations are verified as having actual existence. When they have not, but are believed to have it, there is illusion. It is experience which decides. Exactly at what point in error the dislocation of things is found is very various. Sometimes we have two very complex realities dislocated, as when I fancy a snow mountain to be made of

diamonds, where the wrongly allocated diamonds are themselves complex wholes. In the end, and with the highest degree of incoherence, such as we may get in certain dreams, or in simple cases like that of the hot metal felt as cold, we may have dislocation of simple sensational objects. And what imagination and illusion imply is that corresponding to each act of sentience set going in the mind there is an actual sensum; that the last elements of the world we bring before us in imagining whether correctly or in illusion are real and actual. To each sentient act in any of its intensities there corresponds a sensation or sensum with its appropriate degree.

But the forms of combination of the parts of the world are not necessarily entirely false in illusion. On the contrary, imagination and error always follow, up to a certain point, the combinations found in reality. We all of us know some man to whom, like Titania, we attach by illusion a donkey's head. But we obey nature so far as to complete the trunk by some head or other. Laws of combination of parts are, in fact, as much actual realities as the parts themselves, and they are more important. Why, then, it may be asked, if you maintain that to every elementary image there corresponds an actual object somewhere, why do you not maintain that to every illusory form of combination there corresponds somewhere an actual form of combination? You would then suppose with Empedocles that hippogryphs and centaurs, and all the monsters which the imagination of man has invented, did actually exist at some anterior epoch in the world's history, though, as they have failed to survive, no traces of them remain. It is not necessary to make so violent an assumption for which there is no sufficient evidence in fact, because we have evidence that we do physically handle things and recombine material things into fresh wholes, partly respecting and partly disregarding the combinations which we find in nature, but treating wood as wood and not as clay or water. We alter the arrangement of things to

suit our purposes. What we do in imagination and error is analogous. But instead of acting on the world we so act upon ourselves as to place ourselves where we see things in an order and combination different in the case of illusion from the actual. Error is the mental distortion which presents us things awry. It is the mental mismanipulation of things, or, to use our usual language, the wrong mental vision of them. And the cause of error is the personal tendency of the mind which it owes not to individuality, but to abnormality. It may be perverseness of the senses, or of intellect, or it may have its origin in feeling, the impulsion of prejudice or affection, or any of the faults of will or passion which interfere with the undisturbed contemplation of what is outside us. Every inappropriateness in the action of the mind distorts its vision of things. The man who is in error is wry-necked so that he cannot see normally. To borrow a word from the title of one of R. L. Stevenson's stories, he is thrawn; and the object of science and philosophy, as Plato said long ago, is to twist him round so that he can see.

To have truth is to have your mind working so as to be in presence of objects in the order and arrangement in which they exist. It is therefore impersonal. The mind makes itself receptive of things and passive with regard to them. It does so by depersonalising itself in the two ways indicated above. It uses the personality which sees correctly the partial aspects of things, depersonalising it by thought so as to remove its partial character. But it excludes the personal factors which induce error. Science supplements defects of mind by instruments which extend and make precise the vision. In order to adjust the varying deliverances of the senses, which are affected by the merely personal differences of individuals, it invents standards and methods of precision. For the more glaring causes of error it seeks to remove all passion but that which makes us strain all our powers to be passive to the influence of things. Error is the want of impersonality. It is, therefore, if

we call by the general name of will those dispositions of our mind which keep us in tune or out of tune with the world, an intrusion of a defective will so as to blur the recognition of the things presented to us and thereby declared to be together with us. At the same time to exclude the defects of will is the highest exercise of will. The impersonality which is the condition of knowledge is the extreme cultivation and refinement of personality.

By excluding the personal elements which are introduced into the appearances of things, science and education continue the work which has been already accomplished by the course of evolution. Our mental instruments have been fashioned in conformity with our surroundings through the pressure of practical needs and the sanction of failure and extinction. The normal eye sees the colours which are in nature, because a long history has selected the eyes which act so as to make the distinctions of colour which are useful for practice. Error represents the deviation from the normal method of mental action, for which normal action the appearances of things are not discoloured by personal interference. The cautions of scientific method, the training in scientific impersonality, remove the deviation contained in error and make the mind a mirror of actual things.

Sensations, Perceptions, Images, and Thoughts.

My object has been to develop in the face of certain difficulties the truth that the objects of apprehension are non-mental, and, by doing so, to endeavour to put the reader into the point of view from which the original analysis of perception into the togetherness of two things, of which one is a mind and receives the revelation of the other, becomes convincing. The appearance of the object, always except in simple cases, contains elements introduced into it by the mind, and these elements may, and if they are personal do, vitiate it. But these elements are still non-mental, and the inquiry has shown how this is metaphysically possible. There is no room here for the charge of

representationism, as has been supposed.* But over and above the metaphysical consequences or implications of the method adopted, which do not fall within the scope of this paper, there are two questions raised by this inquiry upon which some remarks seem called for, though they must be tentative and provisional. There is, I hope, no shame in confessing that when I venture out into what Locke calls "the vast ocean of being," I soon get out of my depth.

Sensations, percepts, and the rest are different partial appearances of non-mental objects. Objects present differences of character, like those of colour, or chemical valency, or organisation for breathing, which are the interest of particular sciences. But the differences we have been considering are differences revealed to our minds in virtue of or in response to the various general attitudes which the mind assumes; and they may thus justly be described as the "particular ways in which non-mental objects exist in relation to the apprehending mind."† They are metaphysical distinctions, to which correspond the psychological differences of the activities by which we know them. It is for metaphysics to say what is the relation of the *sensum* to the *perceptum* or the *cogitatum*, all these being appearances of the object to which they belong. In particular, we want to know how sensation can be a character of things, and in the next place how thought can be another character. That there is something contrary to our common habits in treating sensation as an element of things must be admitted. But the difficulty arises from assuming that the simplest elements in the constitution of things must be qualities. Now qualities are permanent, and it would seem therefore that sensations, being less than qualities (for no one doubts that the sensation green is less than the quality greenness), sensations must belong not to the thing but to the apprehending mind. But if sensations

* Stout, p. 240.

† Quoted by Mr. Stout, p. 240, from my previous paper.

are declared, as by me, to be real appearances of things, what kind of appearances are they?

Let us recall the surface distinctions between these various grades of reality. Sensations have a pungency which images miss, but they are relatively momentary, and transitory, and isolated. Percepts are pungent and intrusive, like sensations, but they exhibit relative coherence and complexity, and especially they exhibit permanence, and carry us by the use of prior experience into the past. This difference must not, however, be exaggerated into disparity. A persistent sensation from a permanent object gives us a sensation of identity, so far as identity, that is numerical identity, can be sensed. And it can be sensed just as change can be sensed; and Hume, however much he may have failed to justify his statement, was surely right, when in his famous chapter on the continued existence of things, he referred the broken perception of things to the measure of direct experience of identity. We can therefore have sensation of identity, but it merely means persistence of sensation. When we come to perception, we have revealed to us, even in the simple perceiving of sense qualities, like green or sweet, something which belongs to the past as well as to the present. The intermediate stage between the mere persistence of an identical sensation and the perception of a quality which has permanence is found in the after-sensation, which gives us sensational persistence (identity) combined, it may be, with diversity, though in the absence of the stimulus, and with corresponding changes in the intensity of the sensation. They are metaphysically, as well as psychologically, a link between sensed qualities or percepts and sensed *sensa*, which are less than qualities.

The contrasts of images and percepts need not be repeated here. On the other hand, thoughts have a distinctive character, which has made many separate them completely from the lower appearances. The thought (not, of course, the thinking) shares with the image its want of pungency, but differs from it in

being relatively precise as compared with the shadowy haziness of the image, while, as compared with the sensation or perception, it is highly permanent, and coherent, or organised. It is, in fact, the law of construction of the object, to which the percepts and images conform.

What, then, does sensation mean as a character, not a quality, of an object? and, secondly, how can it be one character of an object along with percepts and thoughts? It is a safe rule of method to turn for guidance in difficulty to what we know best; and the thing we know best is our own mind, which we know not by observing it from without but by living through its life from within, and describing it in words. Now in ourselves we become aware of the difference between the isolated or relatively isolated act, the complex and permanent disposition or habit, and, finally, the still more permanent and organised character, which runs like a thread through all our conations and gives them unity and coherence in all the complexity and diversity of their direction. Our activities are felt by us and known in the only way in which they can be known, as a continuum of activities, within which these distinctions of relative fixity and complexity and, it may be added, of pungency as well, are felt. The difference so much brought into prominence of late of the pungent emotional act and the persistent disposition or sentiment is an illustration, from the region of feeling proper. And it would not be difficult to refine upon the differences in the conative life which correspond to those established in the objects of cognition. What, then, prevents us from following the clue given into our hands by our own minds in order to guess the real nature of sensations and thoughts? If mind is the outcome of a higher physical organisation, and minds are, as they declare themselves to be, things in a world of things, we may take our experience of mind and, discounting what mind owes to its special prerogatives, apply our self-knowledge to make physical things clear. We shall not attribute to physical

things mind, nor life, if the things are not alive; not even a lower grade of life or mind. But with this reservation, we can understand how the simplest elements in the process by which things mark their place in time are sensations, which are the isolated acts in which the permanent qualities express themselves, as a habit expresses itself on occasion in an act. They are, to use a Leibnizian metaphor, fulgurations of the quality. To such a conception we oppose our habitual notion of qualities of material things as being somehow arrangements and notions of whatever constituents we regard as ultimate. But it cannot be too often repeated for those who are likely to forget the lesson, that extension and motion or material substance are in themselves on the same immediate footing as colours and smells; that they, too, are made up of *sensa* and *percepta* and thoughts, and exhibit the same problem of presenting these features in their combination. If sensations are thus the elementary activities in the "life" of a physical thing, *percepts* represent their more permanent habits in action upon a body to which or to whose mind they are revealed; images are these same habits as acting in the past or projected in anticipation into the future, or revealed with or without distortion by foreign elements; while thought is the law of combination of qualities and of their action.

If we ask how sensations and thoughts are alike appearances of things, the answer is found or hinted by following the same guidance. As habit grows out of act and expresses itself in act, so thought lies at the basis of sensation, is revealed after a process of sensational experience, and is continuous with sensation. The *sensum* may be revealed separately, but it is a sensational appearance of a thing which has as its law of construction and action that which is revealed to thinking. The sensation and the thought are equally aspects or appearance. Without law sensations or perceptual qualities would be isolated and incoherent. Without sensation law would be without pungency, it would not sting, it would not be realised

in the direct action of thing on thing. We should have a world of things which would be entirely cut off from each other and owe the whole of their "life" to impulsion from within. Sense and thought are thus equally real, though thought, taking in as it does the whole range of a thing's existence, and comprehending, let me add, the existence of many things of the same species (which obey the same law of construction or action), possesses in the constitution of things a far greater significance than sense. If I am right in assuming that for Plato the "ideas" are such laws of construction and of action, the error we may be compelled to put down to the account, even of Plato, is not that he assigned to "ideas" a real existence in fact (whereas as some think they have only validity and not being); for they have an undoubted existence in fact, and are the most important of all facts that we know. His error consisted in denying sense existence to be also real, and confusing their insignificance with want of reality; or to say the same thing in other words, in declaring "ideas" to be the one reality because they were the most significant features of it.

Appearances and Reality.

It remains to add such remarks as are possible here upon the reality of appearances, as that distinction has been understood in this paper. The reality is the continuous totality of its partial appearances, which appearances are themselves real in turn. How, it may be asked, is, in the first place, such a totality possible at all? and, secondly, how can a partial appearance be regarded as real, if it is only partial? Both questions are answered by making use of the clue which has been used already. In ourselves we live through a connected and continuous whole of life. And in ourselves the single activity does not cease to be actual because it is partial. The first fact indicates how there may be a whole which has varying appearances. And the appearances so spoken of are, it will be observed, actual features of themselves which things present to

other things because of the angle from which they are seen. A column of soldiers has really a different appearance on the front and on the flank, and that difference shows itself in the different action of the front and the flank upon the enemy. A sewing needle used to sew up a dog's wound pierces with the point and tears at the sides, and it is therefore humanely replaced by the surgical needle, which cuts at the side as well as piercing. The table not only is seen differently according to the position of the observer, but it is different and, as language puts it so expressively, it looks different. There is no further need to labour the point. When it is urged that a partial appearance cannot be real, what is meant is that it cannot be true. Its partial character falsifies it. The answer is that an appearance is not falsified by being partial unless it is illusory. An illusory appearance is, we have seen, actual but dislocated, and it betrays its illusory character by failing to cohere with the whole to which it belongs. Its falsity is not due to its partial character but to its intruded element of personality. A partial appearance remains real and true, though incomplete. A woman does not cease to be a woman because she is a mother. A king is not less a man because he is king. Connection with a larger whole does not necessarily remove the characters which a thing possesses before entrance into the whole. Accordingly a partial appearance can only be regarded as false if it is taken by itself as being what it is as in the whole, as if, for instance, the king were treated as being a king apart from society, or as if we treated the triangularity of a pediment as involving a base of thirty-two feet, because a particular pediment happens to have a base of thirty-two feet; or contrariwise, if it is regarded as possessing a property incompatible with the extra qualities which it acquires in the whole, as if a person's youth were apprehended as fixing a limit to his growth. Any appearance to be an appearance of a thing and not an illusion or error must be precisely what it pretends to be. But so understood it remains in the whole, just what it

is when taken by itself; but it may in its connection with the whole receive new determinations which lie outside the appearance as it was taken when it appeared.

But these remarks are perhaps either too few or too many for a difficult subject. They are intended merely to indicate further in what manner appearance as I have used the term is understood.* Nor, to revert for a moment to the idea of a continuous totality, do I suppose that that idea can be fortified against attack by a simple reference to the fact that in ourselves we live through such a totality. The answer can be made satisfying only when the alleged contradictions involved in the notion of a continuous whole can be removed, or accounted for, as I do not doubt they will. It seemed impossible in a paper of this kind to avoid some treatment of these topics, however imperfect. But I hope they will not serve to divert the attention of readers from what is the main purpose of the paper, to expound the metaphysical truth of the non-mental character of the objects of cognition, and in particular of images.

* This interpretation does not, of course, originate with me.

II.—THE SUBJECT-MATTER OF PSYCHOLOGY.

By G. E. MOORE.

IT seems to me that Psychology has a special subject-matter of its own; and that this special subject-matter may be defined by saying that it consists of all those among the contents of the Universe, and those only, which are "mental" or "psychical" in their nature. And the chief thing which I wish to do in this paper is to consider which among the contents of the Universe *are* "mental" or "psychical" in their nature, and how these are distinguished from those which are not. It seems to me that the Universe contains an immense variety of different kinds of entities. For instance: My mind, any particular thought or perception of mine, the quality which distinguishes an act of volition from a mere act of perception, the Battle of Waterloo, the process of baking, the year 1908, the moon, the number 2, the distance between London and Paris, the relation of similarity—all these are contents of the Universe, all of them are or were contained in it. And I wish to ask with regard to them all, which of them are "mental" or "psychical" in their nature and which are not. For this purpose, I wish to have some common name, which I can apply to any one of them, without implying anything more, with regard to that to which I apply it, than simply that it is or was *something*, that it is or was a content of the Universe. And I propose to use the word I have already used—the word "entity"—in this extremely wide sense. When I speak of an "entity" I shall mean to imply absolutely nothing more with regard to that which I so call, than that it *is* or *was*—that it is or was contained in the Universe; and of anything whatever which *is* or *was*, I shall take the liberty to say that it is an "entity." It is by no means clear to me that all "entities"—all the

contents of the Universe—can rightly be said to “exist” or to be “phenomena”; and though all of them are, no doubt (in certain senses of these words), “objects” and “realities” and “things,” yet there are other senses of these words in which many of them are not “objects,” not “real,” not “things.” It is for this reason that I prefer the word “entities” to any of these words which are, I think, sometimes used as its equivalents: the words “existents,” “phenomena,” “objects,” “realities,” “things.” And I may, therefore, put the main question of my paper in the following form: What kinds of “entities” are “mental” or “psychical” entities? And how are those which *are* “mental” entities distinguished from those which are not?

I shall divide my treatment of this question into two parts. I shall, first of all, (1) try to classify those kinds of entities which seem to me to be undoubtedly “mental,” and to consider what it is that distinguishes these from all the other contents of the Universe. And I shall then (2) consider certain entities or supposed entities, with regard to which it seems to me doubtful whether they are “mental” entities or not, and shall inquire in what sense, if any, these could properly be said to be “mental.”

I. ENTITIES WHICH ARE UNDOUBTEDLY MENTAL.

I wish here to define as clearly as I can those kinds of entities which seem to me to be undoubtedly mental, and to consider how they differ from those which are not mental.

To begin with, then: I see, I hear, I smell, I taste, etc.; I sometimes feel pains; I sometimes observe my own mental acts; I sometimes remember entities which I have formerly seen or heard, etc.; I sometimes imagine and I sometimes dream; I think of all sorts of different entities; I believe some propositions, and think of others, without believing them; I take pleasure in certain events, and am displeased at others; and I sometimes resolve that certain actions shall be done.

All these things I do; and there is nothing more certain to me than that I do them all. And because, in a wide sense, they are all of them things which I do, I propose to call them all "mental *acts*." By calling them "acts" I do not wish to imply that I am always particularly active when I do them. No doubt, I must be active in a sense, whenever I do any of them. But certainly, when I do some of them, I am sometimes very passive.

Now I think we may say that, whenever I do any of these things, I am always "conscious of" something or other. Each of these mental acts consists, at least in part, in my being conscious of something. I do not mean to say that, in the case of each of them, I am conscious of something in one and the same sense. For instance, when I actually see a colour, I am certainly conscious of that colour in a very different sense from that in which I am conscious of it when I remember it half an hour afterwards and do not any longer see it. And I am not sure that there is anything whatever in common to these two senses of "consciousness." But still I think the name can certainly be rightly applied to what occurs in both these cases; and that similarly we are, in *some* proper sense of the word, conscious of something whenever we do any of the acts I have named. And I do not know how to explain what I mean by "consciousness" except by saying that each of these acts I have named is an act of consciousness. But still I hope that this is a sufficient indication of what I mean. And I think it is at least sufficient to enable us to say with certainty that certain other acts, which I have not named, resemble these in being acts of consciousness.

"Consciousness," then, for all I know, may be a name for several very different kinds of entities. But in all the cases I have named there is, I think, one thing clear about it: namely, that in every case there is always a distinction between that *of* which we are conscious and our consciousness of it. I do not mean to say that the two are always "separable";

nor yet do I mean to say anything with regard to the relation in which they stand to one another ; I only mean to say that they are always *distinct* entities : and that they are so seems to me to be certain for the following reason. Let us consider any one of the mental acts I have named—seeing, for example. There is nothing more certain to me than that I do constantly see one colour at one time, and a different colour at a different time, and that, though the colours are different, I am conscious of them both in exactly the same sense. It follows, then, that since the colours are different in the two cases, whereas what I mean by my consciousness of them is in both cases the same, my consciousness of a colour must be something different from any of the colours of which I am conscious. And the same result follows, whichever of the mental acts I have named be considered. I am quite certain that I do at different times remember different events, will different actions, etc., and though *what* I remember, *what* I will, etc., may be in each case different, yet what I mean by “remembering” or “willing” may be in each case exactly the same. There is, therefore, always a distinction between *what* I am conscious of and *my consciousness* of it. And the latter of these two distinct entities is the first kind of entity which seems to me to be undoubtedly mental. Whenever anybody is conscious of anything in the sense or senses which I have tried to indicate, then his consciousness, as distinguished from that *of* which he is conscious, is, I think, undoubtedly a mental entity.

“Consciousness,” then, is undoubtedly a name for a mental entity or for several different kinds of mental entities. Every act of consciousness is a mental entity. But what exactly do we mean by saying that it is “mental” ?

The first and most important thing we mean by this is, I think, just simply that it is an act of consciousness. “Mental,” in one of its senses and its most fundamental sense, is, I think, merely another way of saying that the entity said to be mental *is* an act of consciousness. So that, in this sense

of the word, that which distinguishes mental entities from those which are not mental would be simply the fact that the former are acts of consciousness, whereas the latter are not. And, in this sense, it is quite plain that many entities are not mental. A red colour, for example, is certainly not an act of consciousness in the sense in which my seeing of it is. It may, indeed (as some people seem to think), be an "appearance" of an act of consciousness; but, if so, then certainly the appearance is very different from the reality. This sense in which to be a mental entity is to be an act of consciousness is, I think, the most fundamental sense of the word "mental": it is the one from which all others are derived. Had we not noticed the difference between acts of consciousness and entities which either are not or do not seem to be such, no one would ever have thought of dividing entities into mental or non-mental, or of speaking of "mind" at all. But though this is the most fundamental sense of the word "mental," there certainly are others derived from it, and important ones too, which might allow us to say that entities, which are not acts of consciousness, nevertheless are mental. And I must go on to speak of these.

The first of these is a property which might be thought to belong to *all* mental acts, and to be a further characteristic, in addition to the fact that all of them are acts of consciousness, which distinguishes them from entities which are not mental. And this characteristic is one which is, I think, certainly very often meant by the word "mental"; when it is said that an entity is "mental" or "in the mind," it is, I think, very often meant that it has this characteristic. The characteristic I mean is the one which we express by saying that a given mental act is an act *of the same person* or *of the same mind* as another mental act. All the mental acts, of the existence of which we are most certain, do seem to have this characteristic. Each of them is the act of some one mind, and is related to a certain number of other acts by the fact that they

are all of them acts of the same mind. In fact, all the mental acts we know best seem to be divided into groups, each group having the characteristic that all its members are acts of the same mind. Thus, for example, a certain number of the mental acts in the Universe have been mental acts of mine, a certain number have been the mental acts of King Edward VII, and so on in millions of other instances. That many mental acts have this characteristic, and that it is a most important characteristic, seems to me as certain as anything can be. Thus, for example, I am quite certain that a certain number of mental acts really have been mental acts of "mine"; that what I mean by saying that they are all "mine" is a most important characteristic that they have; and that it is one which distinguishes them from the mental acts of other people. That this is so we all of us constantly assume, and no philosopher has, I think, ever succeeded in avoiding the implication that it is so. The language we use constantly implies that one respect in which two mental acts may differ from one another is by the fact that one of them is the mental act of one person and the other the mental act of another person; and that one respect in which two mental acts may resemble one another is by the fact that both of them are mental acts of the same person. And that something important is meant by this language seems to me to be quite certain. As to *what* exactly is meant I confess I cannot be sure; and I shall presently have to say what I can about the matter. For the present, I wish only to insist that *something* true is meant when it is said that two mental acts are mental acts of the same person; that, for instance, there is *some* sense in which *my* mental acts are all *mine*. And hence that, if it is said to be a characteristic of all mental acts that they are the mental acts of somebody or other—that they all belong to *some* mind, though different ones to different minds—these words would express a characteristic which *might* belong to all mental acts, and which, if it did, would be a characteristic in addition to, and distinct from, that

which is expressed by saying that they all *are* acts of consciousness. This characteristic, it seems to me, is one which is often meant when it is said that a given entity is "mental" or "in the mind": it is meant that the entity in question is related to some mind in the same way in which his mental acts are related to him—by that relation which is expressed by saying that they are all *his*. And if this be used as a *positive* criterion of what is mental, I can find no objection to it. That is to say, if it be said that any entity which *has* this relation to any person or to any mind is "mental," I should be prepared to admit it. It does seem to me, for example, that if any entity were related to me or to my mind in just that way in which my mental acts are related to me, we might quite properly say that such an entity was "mental," and was "in my mind" in the same sense in which my mental acts are "in my mind." Whether any entities, except mental acts, are or can be related to me in this way, is a question which I shall presently consider. But, *if* any are related to any mind in this manner, then I should say we might properly call them "mental." Here, therefore, we have a sense of the word "mental" which might possibly include other entities besides acts of consciousness. But if this characteristic be also proposed as a negative criterion of what is "mental"—if, beside saying that anything which *does* possess it is "mental," it be also said that nothing which does *not* possess it, is so—then, the assertion seems to me to be very doubtful. For it seems to me possible that there may be acts of consciousness which are *not* the acts of any mind—which are not related to any other acts, in the peculiar way in which the mental acts of any one person are related to one another. That there might be acts of consciousness, isolated in this way, seems to me possible; and if there were, then certainly they would be "mental" entities, simply because they were acts of consciousness. That there are any such I don't feel at all sure; but the mere possibility that there should be seems to me a sufficient objection to saying that

nothing can be "mental" except what belongs to some mind in the sense in which my mental acts belong to mine.

The second characteristic I wish to mention is one which cannot, I think, be said to be a "meaning" of the term "mental," but which may be and has been proposed as a *criterion* of what is "mental," and which is certainly a very important characteristic. It has been suggested, namely, that any entity which *can be directly known by one mind only* is a mental entity, and is "in the mind" of the person in question, and also, conversely, that all mental entities can be directly known only by a single mind. By "direct knowledge" is here meant the kind of relation which we have to a colour, when we actually see it, or to a sound when we actually hear it. And the suggestion that all mental entities have the characteristic that they can be directly known, in this sense, only by one single mind, is, I think, certainly plausible for the following reason. It certainly is a very remarkable difference between my own mental acts and those of other people, that my own are the only ones that I ever know directly. I certainly never have been conscious of anybody else's thoughts or feelings or perceptions in that direct manner in which I am conscious of a colour when I actually see it; but of my own mental acts I am very often conscious in this direct manner. I am, of course, conscious, in a sense, of the mental acts of other people; I do know some of them, in a very real sense, and know a great deal about them; but certainly I am never *directly* conscious of them, I do not know them *directly*, in the sense in which I often know my own. This is, I think, certainly a very remarkable distinction between my mental acts and those of other people. And the rule seems to be a nearly universal one: it seems to be nearly universally true that each of us can only know directly *his own* mental acts—never those of any other person. No one, for instance, that I know of, except myself, has ever known directly any mental act of mine. There is, therefore, plausibility

in the suggestion that this may be a universal characteristic of mental acts: it certainly belongs to all of those which we know best, and know most about. But yet I think it is doubtful whether it belongs to *all* mental acts. There seems to be no reason why it should: no reason why one person should not *ever* be able to know directly the mental acts of any other person; at best it seems only to be a fact that no one ever does. And, moreover, there seems to be a certain amount of evidence that it does actually occur in very rare cases. Dr. Morton Prince's "Sally" seems to have claimed that she knew directly some of the mental acts of B I; and if we admit her claim, and if also we admit (and for this also there is much to be said) that Sally was a different person from B I, this would be an instance of the direct knowledge by one person of the mental acts of another. I think, therefore, that it is doubtful whether it really is a characteristic of all mental acts, that they can be directly known by one mind only. And as for the converse proposition—the proposition that any entity which can be directly known by one person only must be mental, and must be "in" that person's "mind," it seems to me more doubtful still. Even if it were true that all undoubtedly mental entities can only be known by one person, namely the person "in" whose "mind" they are, there would seem to be no reason whatever why some non-mental entities should not possess the same characteristic. And, supposing any entities, except mental acts, do possess it, we should, I think, certainly need other and independent evidence that they were "mental," in order to be entitled to call them so. On this ground alone, we certainly should not be so entitled.

So far, then, my conclusions have been as follows: I started with mental acts—acts of consciousness—as being undoubtedly mental entities. And I considered three characteristics, which might be held to distinguish them from entities which are not mental. The first was the mere fact that they *were* acts of

consciousness; and this is a characteristic which, of course, does belong *ex hypothesi* to all of them; but also it is a characteristic which can, *ex hypothesi*, belong to no entity except an act of consciousness. This, I said, seemed to me to be the most fundamental sense of the word "mental," but I admitted that there were others. The second characteristic was one which does seem to belong to most mental acts, namely, the characteristic that they are all of them acts of some person or other—all of them belong to some mind; and I admitted that any entity which did belong to a mind, in this peculiar sense in which my mental acts belong to mine, would be mental. I admitted this, then, as a second sense of "mental"; but I urged that possibly some mental acts were not mental in this sense—were not the acts of anybody: so that there might be entities which were undoubtedly "mental" in the first fundamental sense, and yet not "mental" in this second one. The third characteristic was also one which does seem to belong to most mental acts and does *perhaps* belong to all; namely, that they are entities which can be *directly known* by one person only. But in the case of this characteristic I urged that there seems no reason why it *should* belong to all mental acts—no reason why one person should not sometimes be able to know directly the mental acts of another; and also that there is a certain amount of evidence for believing that this actually does sometimes occur. And as for the contention that *every* entity which possesses this characteristic is "mental," I urged that, if this is true, we certainly must have some *other* reason for saying that all such entities are mental beside the mere fact that they possess this characteristic. This characteristic alone would not entitle us to call them so; for it certainly is not one of the characteristics which we *mean* by "mental," even if it should turn out to be a criterion of what is mental.

I have, therefore, so far recognised two different senses of "mental," and only one sort of entities—namely, acts of

consciousness—which are undoubtedly mental. All acts of consciousness are mental in the first sense, and nothing else can be. Whereas in the second sense it is not quite certain that all acts of consciousness are; and also it is abstractly possible that some entities, which are not acts of consciousness, should be.

But I have now to recognise two other sorts of entities which seem to me to be undoubtedly mental; and two new meanings of “mental” corresponding to them.

The first sort of entity is as follows:—

Different acts of consciousness may differ from one another in various respects. And some of the differences which there are between them seem to me to be undoubtedly mental differences. These differences which I call mental differences are the second sort of entity which I recognise as undoubtedly mental. But in order to make plain what sort of entities these undoubtedly mental differences are, I must contrast them with two other kinds of differences which there are, or might be, between different mental acts. The first kind is a kind of difference, which there undoubtedly is, between different mental acts; and far more mental acts differ from one another in this respect than in any other; but it does not seem to me to be a “mental” difference. The second kind is a kind which *might* be as universal as the first; but, in this case, I am not sure that any mental acts do differ in this possible respect at all. There remains, as a third kind, the sort of difference which does seem to me to be an undoubtedly mental entity: some mental acts do undoubtedly differ from one another in this third way, and also the difference is undoubtedly a mental one.

The first kind of difference is the difference which merely consists in the fact that one act of consciousness is a consciousness *of* one entity, whereas another act of consciousness is a consciousness *of* a different entity. For instance, when I see a blue colour, I am conscious of a different entity from that of

which I am conscious when I see a red one. And my seeing of the red certainly does differ from my seeing of the blue, in respect of the fact that whereas the one is a consciousness of the red, the other is a consciousness of the blue: the mere fact that one is of the red and the other of the blue *is* a difference between them. So, too, when I remember the Crystal Palace, and remember St. Paul's Cathedral, there is a similar difference between the two acts of memory: the one is a consciousness *of* the Crystal Palace and the other *of* St. Paul's Cathedral, and the two acts do certainly differ in respect of the fact that one is *of* the one entity and the other *of* the other, whether they also differ in other respects or not. There is no kind of difference between mental acts more universal than this. We are all of us, in the course of our lives, conscious of millions of different entities, and our consciousness of each differs from our consciousness of all the rest, in respect of the fact that it is a consciousness *of* the entity of which it is, and not of any other different entity. But this kind of difference does not seem to me to be *itself* a mental difference. I confess I cannot tell *why*. It certainly is a sort of difference, which can only obtain between mental acts: since nothing but a mental act can differ from anything else, in respect of the fact that the one is a consciousness of one entity whereas the other is a consciousness of a different entity. But, nevertheless, it does not seem to me to be a mental difference; and, though I cannot tell why, I can illustrate by analogous examples the sort of reason why I think so. For instance, one area in space may be occupied by one kind of object, and another area by another kind; and these two areas will then differ in respect of the fact that one is occupied by the one object and the other by the other. Yet we should not say that this difference between them was a *spatial* difference; although it is a difference between spatial entities, and a sort of difference which can *only* obtain between spatial entities, since nothing but a spatial entity can be "occupied by" anything, in the sense in which a spatial area

is occupied by the object which is *in* that area. Or, again, one physical event—for instance, a particular arrangement of particles in one part of the brain—may differ from another physical object, in respect of the fact that the one is a necessary condition for a mental act of one kind and the other a necessary condition for a mental act of another kind; and yet we should not say that this difference was *itself* a *physical* difference between the two. It seems to me that there is, for similar reasons, an objection to saying that the difference between two mental acts, which merely consists in the fact that one is a consciousness of one entity and the other of another, is *itself* a mental difference.

But the second sort of difference, which there might be between mental acts, *would*, if there were such a difference, undoubtedly be a mental one; only I am not sure that there is any such difference, and therefore cannot reckon it among entities undoubtedly mental; I shall presently discuss it among cases of doubtful mental entities. It seems, namely, to be held by some philosophers that any mental act which differs from another in respect of the fact that whereas one is the consciousness of one entity, the other is a consciousness of a different entity, must or does always *also* differ from the other in some *other* respect—in some *internal* respect: that wherever there is that difference of relation, which consists in the fact that two mental acts have different *objects*, there must also be some other *qualitative* difference between the two—beside the difference of *objects*, *also* a difference of "*content*." If there were such a difference as this between mental acts, I should say it would certainly be a mental one. But I am not sure that there is any such difference. I am not sure that, in any case whatever, two mental acts which differ in respect of the fact that one is a consciousness of one entity and the other a consciousness of a different entity, need, for that reason, differ internally or qualitatively in any respect at all.

But it seems to me quite certain that some mental acts do

differ internally or qualitatively from others; and that differences of this third class are undoubtedly mental differences. I said, to begin with, that every mental act consists, at least *in part*, in the being conscious of something. But some of them, I think, plainly consist also in something else. I sometimes merely think of a given proposition, and then, I think, I am merely conscious of it; but I sometimes believe it, and then, besides being conscious of it, I am conscious of it in a particular way—my consciousness of it has a quality, which seems to me undoubtedly mental, which differentiates an act of belief from a mere act of consciousness. So, too, I sometimes merely think of a possible future action; but sometimes I *will* that action: and here again there seems to me to be a real mental difference between the two cases. I should say then that the quality which distinguishes an act of will from what is not an act of will, or an act of belief from what is not an act of belief, is undoubtedly a mental entity. And there are, I think, a limited (though still a large) number of other mental qualities of this kind: for instance, that which distinguishes the being pleased with an object from the mere apprehension of the same object without being pleased with it; that which distinguishes the desiring of an object from the apprehension of it without desire; that which distinguishes the disliking of an object from the apprehension of it without dislike, etc. Such differences between mental acts seem to me to be certainly different in their nature from my first sort of differences—those which merely consisted in the fact that, whereas one mental act was a consciousness of one sort of object, another was a consciousness of another. For one thing it seems to me that, even where there is no difference in the object, there may be a difference in the mode of consciousness: that, for instance, I may at one time apprehend one and the same proposition without believing it, and at another time believe it. And these differences, which I may call differences in the mode of consciousness, seem to me also to differ from the second sort

of differences I mentioned, in respect of the fact that whereas the latter were supposed to be internal differences corresponding to a difference of object, these do not so correspond: I may be conscious of two different objects in the same way, and of the same object, at different times, in different ways. Moreover, whereas I cannot be certain that there are any internal differences corresponding to a difference of objects I am certain that there are differences in the mode of consciousness. I am quite certain that there is an internal difference between willing an action and merely thinking of it; between liking an object and merely seeing it: but not certain that there is any internal difference between seeing a red colour and seeing a blue one, or between seeing a colour and hearing a sound.

I recognise, then, as a second kind of undoubtedly mental entities, the qualities which distinguish one mode of consciousness from another. And these qualities, it seems to me, are "mental" in some new sense. They *are* not themselves acts of consciousness, but are, in some sense, qualities of such. In *what* sense exactly, I cannot discover. It seems obvious to say that they are mental, because they are qualities of a kind which can *only* belong to acts of consciousness: nothing but an act of consciousness can have the quality of being a volition, or being a belief. But then it is also true that nothing but an act of consciousness can have the property of being a consciousness of blue, or a consciousness of red. And in what way such a property, which I call a "property," differs from these other properties, which I call "qualities," I cannot define. Assuming, however, that the difference is understood, we may, I think, say, that to be "mental," in this third sense, *means* to be a "quality" (as distinguished from a "property") which can only belong to an act of consciousness.

Finally, a third kind of entity, which seems to me undoubtedly mental, may be defined as follows. A number of mental acts may be related to one another, in one or other of

the hundred different ways, which may be expressed by saying that they form a "unity." And any collection of mental acts, which does in any sense form a "unity," may itself be said to be a "mental entity." For instance, a process of reasoning is not itself a "mental act"; it consists of a number of different mental acts, combined together in some particular way: and yet it is undoubtedly a "mental entity." Any such collection of mental acts is, therefore, a mental entity; and is so in the sense that it is a collection of mental acts having some sort of unity. Here, then, is a fourth sense of "mental": namely, the being a collection of acts of consciousness, as distinguished from being a single act of consciousness.

I recognise, then, three kinds of undoubtedly mental entities: (1) An act of consciousness; (2) certain "qualities" of acts of consciousness; (3) any collection of acts of consciousness which has some sort of "unity." And I cannot be certain that there are in the Universe any entities, deserving to be called "mental," except these. These, it seems to me, are marked off by very sharp and important lines of division from all other entities. And the certainty that these *are*, and are "mental," seems to me very much greater than in the case of any other sorts of entities which are sometimes said to be so.

II. DOUBTFUL MENTAL ENTITIES.

Under this head I want to consider two kinds of cases: namely, firstly, cases where it may be supposed there is an entity, which, if there were any such entity, would undoubtedly be a mental one, but where it seems to me doubtful whether there really is any such entity as the one supposed; and secondly, cases of entities which undoubtedly *are* and which some people suppose to be "mental," but where it seems to me doubtful whether they are mental or not.

(1) The first entity I wish to consider under this head is *the mind itself*. It might be thought that, if any entity deserves to be called "mental," the mind itself undoubtedly does deserve

it; and that, so far from being reckoned among doubtful mental entities, it ought to be reckoned as the clearest and most undoubted case of a mental entity. And, in fact, I do not doubt that the mind is a mental entity. I do not doubt, for instance, that I have a mind; that there is such a thing as my mind; and that it is a mental entity. But all that I mean when I say this, is that I am quite sure that when I or other people talk about "my mind," we are talking about something which really is and which is mental; that "my mind" is the name of some entity or other, and that a mental one. What I do doubt about, in the case of my mind, is what sort of an entity it is: in particular, whether it is an entity of one of the kinds which I have already described; or whether it is a new kind of entity different from any of these, and which is also "mental" in a different sense from that in which any of them are "mental."

There is a view (and I think Hume held it, for one) that my mind merely consists in the sum of all those mental acts, which are related to one another in the way which we describe by calling them all "mine"; including, of course, any other entities (if there are any), beside mental acts, which may be related to my mental acts in this same way in which they are related to one another. And I cannot be sure that this view is not a true one. I am, in fact, much more sure that there are such things as my mental acts, than that there is any entity distinct from these, which could be called my mind. And if this view *were* a true one, if my mind does consist merely in the sum of my mental acts, it would, of course, merely be an instance of the third kind of entity, which I recognised as undoubtedly mental: it would be a collection of acts of consciousness, having some kind of unity.

In favour of this view I have to urge the difficulty that I find in discovering any entity, other than my mental acts, which could be my mind. And, also, it alone seems to me to allow any proper sense to the phrase we are tempted to use

when we say that such and such an entity, such and such a mental act, for instance, is "in the mind." If my mind is merely the collection of all my mental acts (and perhaps some other entities), each of them could be properly said to be "in" it, in the sense of being one among the collection. Whereas, on any other view, I do not see how any mental act, or anything else, could be properly said to be "in" the mind at all.

But, on the other hand, there seem to me to be certain arguments against this view. We certainly talk, also, as if it were my mind which hears, my mind which thinks, my mind which wills; as if, in short, my mind were some entity, *of* which my mental acts are acts; as if it were identical with the Ego, the "me," the subject, which is conscious whenever I am conscious. And though a meaning can be given to these expressions, on Hume's view of the mind, it does not seem to me to be the meaning which they actually have. On Hume's view, we should have to hold that, when I say that *I*, or my mind, am seeing this paper or thinking these thoughts, what I mean is simply that my seeing and my thinking are, each of them, one among the mental acts which constitute me or my mind. And it does not seem to me that this is what I do mean. It seems to me that, when I say that *I* am seeing this room now, and saw another yesterday (and I am sure that I really am, and really did), I mean to assert quite a different sort of relation between me and my seeing, than that the latter is *a part* of me—one member of a collection of acts which constitutes me.

Moreover, even on Hume's view, there still remains the difficulty of saying what kind of relation it is that all my mental acts have to one another, which constitutes them "mine." That they most certainly have some relation to one another, which we express by saying that they are all "mine," I have already urged; some relation which distinguishes them from the mental acts of other people. And, if we consider what this relation can be, this consideration also seems to me to

point to the falsity of Hume's view. What I seem to know, when I know that all my mental acts are mental acts of *mine*, is that they all have a peculiar relation to some other entity which is me. I seem to know that their relation to one another consists in the fact that they all have the same relation to this other entity: I do not seem to be directly aware of any other relation which they all have to one another.

I think, therefore, there is something to be said for the view that *I* am an entity, distinct from every one of my mental acts and from all of them put together: an entity, whose acts they are; which is that which is conscious when I am conscious; and that what I mean by calling them all "*mine*," is that they all of them are acts of this same entity. But even if I am such an entity, it does not follow that it is a mental entity. There is still another hypothesis, against which I can find no conclusive arguments: namely, that this entity which hears and sees and feels and thinks is some part of *my body*. I cannot see anything conclusive against Locke's view that matter may be capable of being conscious; and hence that it may be my body which is conscious whenever I am conscious. If this were so, then, I should say we could not identify myself with "*my mind*." I myself should not, then, be a mental entity: I should be my body. Whereas anything that is properly to be called "*my mind*" must, I think, be allowed to be "*mental*." But we might combine this with Hume's view by saying that "*my mind*" was the collection of my mental acts; and that what made them all "*mine*" was not any direct relation they had to one another, but the fact that they all had a common relation to my body.

The view, therefore, that "*my mind*" is a mental entity, distinct from any one of my mental acts and from all of them, seems to me to be only one among several possible alternatives, against none of which I have ever seen or can find conclusive arguments. But it does seem to me to be one possible alternative and if it were true, then, we should have to

admit that there is another mental entity, distinct from any of those I have hitherto recognised, and "mental" in a different sense from any of them. Every mind would, then, be a mental entity of a new sort; and it would be "mental" in the sense that it was something, *not* the body, *of* which certain mental acts were the acts—that it was that which is conscious whenever anyone is conscious.

(2) The second hypothesis I wish to consider is the hypothesis, previously mentioned, that any two mental acts which differ in respect of the fact that, whereas one is a consciousness of one entity, the other is the consciousness of a different entity, *also* differ in some other respect—have some mental difference, some internal difference, some difference of "quality" or of "content." If this were so, the quality which differentiated one from the other would undoubtedly be a mental entity, and a mental entity in the same sense in which the quality which differentiates belief or volition from mere apprehension is a mental entity.

Here, too, there seem to me to be arguments upon both sides. On the negative side—in favour of the view that there are no such entities—there seems to me to be the fact that I am quite unable, by introspection, to discover any such entities. When I consider what happens when I see a blue colour, or see a red colour, or hear a sound, I am quite unable to discover that there is any difference between the three cases, except that in the one case what I am conscious of is blue, in the other red, in the third a sound instead of a colour. My *consciousness* of all three seems to me to be exactly the same in its nature. And so, too, when I think of St. Paul's Cathedral, or think of the Crystal Palace, all that I am able to be certain of is that, in the two cases, I am conscious of different entities—not that, in each case, my consciousness has a further difference—a difference of quality.

But on the other side, too, there seems to me to be some evidence. The argument which appeals to me on this side

is that drawn from the causal connection between mental acts. Nothing seems to me more certain than that my consciousness of one object may (in some sense) have different effects from my consciousness of another object, even where I cannot discover any difference between the two except the fact that the one is a consciousness of one object and the other of a different one. For instance, I am quite sure that the sight of one object does cause me to remember some sorts of things, whereas the sight of another object will cause me to remember different things. But how, it may be said, can this be if the consciousness of the one object does not differ at all in quality from that of the other? It might be attempted to answer this by saying that it is the different objects, and not my consciousness of them, which produce the different effects. But it seems to me pretty certain that this is not always, if ever, the case. What produces the effect is something which exists *now*, and the object does not by any means always exist when I think of it. For instance, if I happen to think of the Battle of Waterloo, this thought may lead me to have other thoughts which I should not have had if I had not thought of the battle; but it is (in some sense) my thought which exists *now*, which causes these other thoughts, not the battle itself, which does not exist now. I think, therefore, that it cannot be the different objects which produce the different effects; and therefore there seems to me some force in the argument that there must be some internal difference in my consciousness of the one and of the other, although I can discover none. But there does seem to me to be one possible alternative: namely, that in each case it is neither my consciousness of the object, nor the object itself, which produces the effect, but the whole fact—the fact that I am conscious of the object. This fact—the whole fact—is, it seems to me, certainly a different entity both from the object, and from my consciousness of it, if we mean by the latter merely what I have hitherto meant—namely, what is left over when we subtract the object from the

whole fact. And the whole fact—the fact that I am conscious of one object—is certainly always different from the fact that I am conscious of another object, even though my consciousness of the one may be exactly similar, internally, to my consciousness of the other. But I do not feel sure that this hypothesis will remove the difficulty; and therefore I reckon possible qualitative differences between mental acts, corresponding to every difference in their objects, as possible mental entities.

(3) The third question I wish to consider is one which was discussed at considerable length in both the two last papers of last Session, by Dr. Wolf and Professor Stout. It concerns those entities, which are often called “sensations” or “sense-presentations,” but which I shall call, by preference, “sense-data.” By sense-data I understand a class of entities of which we are very often directly conscious, and with many of which we are extremely familiar. They include the colours, of all sorts of different shades, which I actually see when I look about me; the sounds which I actually hear; the peculiar sort of entity of which I am directly conscious when I feel the pain of a toothache, and which I call “the pain”; and many others which I need not enumerate. But I wish also to include among them those entities called “images,” of which I am directly conscious when I dream and often also when awake; which resemble the former in respect of the fact that they *are* colours, sounds, etc.; but which seem, as a rule, like rather faint copies of the colours, sounds, etc., actually seen or heard, and which, whether fainter or not, differ from them in respect of the fact that we should not say we actually saw or heard them, and the fact that they are not, in the strictest sense of the words, “given by the senses.” All these entities I propose to call sense-data. And in their case there is, of course, no question whether there *are* such entities. The entities meant certainly *are*, whether or not they be rightly described as “sensations,” “sense-presentations,” “sense-data,” etc. Here the only question can be, whether they are “mental.” And, in fact, many

philosophers seem to have held that they are so. Professor Stout, for example, held that they *all* are; Dr. Wolf, that some of them, namely "images," are and the rest not. I want briefly to consider in what sense, if any, these entities could be "mental."

But it is necessary here to distinguish two questions. Of some of these entities we certainly are sometimes directly conscious. But Professor Stout held, and I daresay others would agree with him, that they often exist in the mind, even when we are not conscious of them. I wish, therefore, to distinguish the two questions—(a) in what sense those sense-data of which we are directly conscious may be mental, and (b) in what sense those, if any, which are alleged to be in the mind, when we are not directly conscious of them, could be so.

(a) Some philosophers, I think, have held these entities to be mental, because they failed to distinguish between them and our consciousness of them—failed to distinguish, for instance, between a blue colour which I see, and the direct consciousness which I have of it when I see it. For instance, I think it is plain from many passages in Hume that he failed to distinguish these two sorts of entities. In fact, he often confused an act of consciousness with that *of* which we are conscious. And we might, therefore, say of him that he thought sense-data to be mental, partly because he mistook them for acts of consciousness. But it is, I think, clear that they *are* not acts of consciousness, whatever they are. They are not, therefore, "mental" in my first and fundamental sense.

A second view which might be held, and has, I think, often been implied, is that they are what I have called "qualities" of conscious acts, and "mental" in this sense. But I think it is clear that this is not a true view either. It seems to me clear that the relation which a blue colour has to my consciousness of it, when I actually see it, is quite a different relation from that which the quality which distinguishes a volition or a belief from mere apprehension has to the act of consciousness which

is a volition or a belief. When I am conscious of a blue colour, my act of consciousness is a consciousness *of* that colour: I am conscious *of* the colour. But when I will that an action should be done, this act of consciousness is not a consciousness *of* the quality which makes it a volition. I think, therefore, it is clear that sense-data, when I am conscious of them, are not qualities *of* my act of consciousness, in any sense in which what is a quality *of* an act of consciousness must be "mental."

A third view seems to be that these sense-data are mental in the sense that they have to my mental acts and to one another exactly that relation which my mental acts have to one another, and which I describe by calling them all "mine." This view is, in short, that sense-data are "mental," in the second sense which I recognised above: that the sense-data of which I am directly conscious are "in my mind" and related to my mind in exactly the same sense in which my direct consciousness of them is so. And against this view I have only to say that it does not seem to me to be so. I cannot persuade myself that a blue colour which I see is related to me in exactly the same manner in which my seeing of it is related to me. It seems to me to be related to me in no way at all except by the fact that I am conscious *of* it. But my consciousness of it is related to me in quite a different manner from this. Of my consciousness I am not by any means always conscious. Its relation to me is simply that it is my consciousness, an act of consciousness of mine: and the blue which I see certainly does not seem to me to be "mine" in this sense, whatever that sense may be. Hence, I cannot accept the view that *any* of the sense-data of which I am directly conscious—either "sense-data" proper or "images"—are related to me or to my mind in the manner in which my consciousness of them and my other mental acts are related to me. And I wonder that anybody should be able to feel sure that they really are so related. The relation which my mental acts have to me and to one another—the relation which I indicate by

calling them "mine"—seems to me to be a very peculiar relation; and, in practice, I can distinguish with the utmost certainty whether a given mental act has it or not; I am hardly ever in any danger of confusing another person's mental act with one of mine; and even, if I should confuse them, I should know quite well (though I cannot define) what I meant by calling it "mine." How am I to be assured that the sense-data, of which I am conscious, are related to my mental acts in this peculiar manner in which my mental acts are related to one another? All I can say is, that they do not seem to me to be so; that I can see no trace of their being so. But, on the other hand, it does not seem to me to be a question about which it is, at present, possible to be certain—to be certain either way. I conclude, then, that it is by no means certain that the sense-data or images of which I am directly conscious are related to me in this way: I see no reason to think they are; but, *if* they were, then, I think, they certainly would, in a perfectly good sense, be "mental" entities.

But finally it may be contended that these sense-data are "mental" on still another ground. It may be contended that absolutely every sense-datum, of which I am ever directly conscious, is an entity which *is* only at the moment at which I am conscious of it: that when my consciousness of it ceases to exist, it also always at once ceases to be; that it *is*, only when and so long as I am conscious of it. And the same in the case of all other minds: that all the sense-data of which anybody is ever conscious are entities which *are* only so long as that person is conscious of them. This is a property which does seem to me to belong to all "images"; and the fact that it does so seems to me sufficient to explain why people should be inclined to say that "images" are merely in their minds. But whether all the sense-data, which are in the strictest sense "given by the senses," also have this property, seems to me a very difficult question. Here, again, there seem to me to be good arguments on both sides; but none such as to justify

a certain conclusion either way. And I have not space here to consider them as fully as they deserve. What I do wish to consider is, whether, if this were so, we should be justified in saying that all sense-data were mental; whether, for instance, supposing that all the images, of which I am directly conscious, are entities which have being only so long as I am directly conscious of them, I should be justified in saying that they were all mental and had being only in the mind. It seems to me that we could say this in a very good sense. If this view were true, the sense-data of which we are directly conscious, would certainly be attached to the minds of each of us in a very close and intimate sense; and that they should be attached to our minds, in this sense, would be a most important metaphysical property of theirs. But nevertheless it seems to me that there would be a great risk of confusion in saying that they were "mental," or "merely in the mind" or "part of the mind" on this ground alone. It seems to me that no philosopher does ever, when he talks of an entity being "mental," mean *merely* that it has this property. I cannot believe, for instance, that Dr. Wolf, when he contended that images were "mental" and "a part of the mind," meant *merely* to assert that they had this property—merely that they are entities, which *are* only so long as we are conscious of them. It is, I think, when an entity is said to be "mental," without qualification, always implied that it is so in some one of the other senses which I have considered; and hence, if by calling sense-data "mental," it is meant *merely* to assert that they have this property, it should always be expressly stated that this and this only is meant.

(b) I pass now to consider the supposition that sense-data may be "in the mind" even when we are not directly conscious of them. And my reason for considering this supposition separately from the last is that, in their case, it obviously cannot be meant merely that they *are* only so long as we are conscious of them; since it is expressly asserted that they are

when we are *not* conscious of them at all. All the arguments, therefore, directed to show that sense-data, of which we *are* directly conscious, exist only when we are conscious of them, cannot be used at all in favour of this second hypothesis; and yet it seems to me that these arguments are far stronger than any others which can be used to prove that sense-data are "mental" in any sense at all. If sense-data, of which we are not directly conscious, can be in the mind at all, they must be so in some one of the other senses which I have considered; and the reasons which I gave for doubting whether sense-data, of which we *are* directly conscious, are in the mind in any of those senses, will apply equally to these supposed sense-data, of which we are *not* directly conscious.

III.—EPISTEMOLOGICAL DIFFICULTIES IN PSYCHOLOGY.

By WILLIAM BROWN.

So much has been written during the last few years on the philosophical difficulties inherent in psychology that some apology seems needed, especially to this Society, for again calling attention to so well-worn a subject. Its importance may, however, be pleaded as a sufficient excuse, and in view of the wide-spread tendency among psychologists to minimise or even to deny such difficulties, a brief statement of them from the psychological point of view will not, perhaps, be entirely valueless. Unfortunately, the controversy has been vitiated by exaggerations on both sides, coupled with not a little wilful misunderstanding, and while philosophers are ready, on the strength of epistemological considerations, to deny the possibility of a science of psychology, certain psychologists make the claim that their science is as independent of philosophy as are any of the physical sciences, and this in face of the fact that whereas there is practical unanimity in the definition of the standpoint and method of these latter sciences, psychology shows almost as many definitions as there are psychologists of eminence who make it their special study.

The various difficulties which this paper sets out to consider are closely inter-related, and any separation of them, such as is necessary for the purposes of exposition, is certain to be somewhat artificial; there is, however, an order of treatment sanctioned by convention, which I shall find it well to follow.

I.

The first difficulty, then, is that of marking off the subject matter of psychology from that of the other sciences, physical and mental, and all that I am concerned to show here is that

any definition which limits itself to the data of introspection and, relying on the distinction between the act of experiencing and the object of the experience, between the "process" and the "content," lays the stress for psychology upon the former of the two correlatives, really stultifies its procedure *in limine*.

Introspection may indeed succeed in distinguishing one act of experiencing as different from another act, quite irrespective of difference of content,—may, for example, be able to detect a difference between the process of questioning and the process of desiring, apart from any difference there may be between what is questioned and what is desired. But this is the limit of its powers. It cannot analyse these acts of experiencing in any sense whatever, for they never become its object. They are experienced but not known. As experienced, moreover, they possess worth or value, and from this psychology explicitly abstracts in order to mark itself off from the other mental sciences, such as ethics and history. If, then, introspection is still trusted to give us a positive science, this must be of the contents of consciousness. But physics, chemistry, biology—all the physical sciences—are based on the contents of individual consciousness. How, then, can we mark off psychology from these? Professor Münsterberg* has suggested that whereas the physical sciences are concerned with those portions of the presented object which can be thought of as capable of being experienced in common by several subjects, psychology deals with that in the presented object which can only be experienced by one subject. In further explication of this distinction, however, he writes:† "Unsere Definition, dass das Psychische nur einem vorfindenden Subjekt, das Physische aber mehreren erfahrbar ist, muss somit nochmals korrigiert werden. Wir können jetzt sagen, dass der Begriff des individuellen vorfindenden Subjekts

* *Grundzüge der Psychologie*, p. 72.

† *Op. cit.*, p. 74.

als rein logischen Beziehungszentrums es unmöglich macht, dass irgend ein individuelles Subjekt etwas erfährt, das Objekt des überindividuellen Subjekts ist. Das Physische ist also nicht mehreren vorfindenden individuellen Subjekten gemeinsam, sondern richtiger, es ist das für mehrere aktuelle Subjekte gemeinsam gültige Objekt gedacht als ein Vorfindbares, also losgelöst von der Aktualität; es ist vorfindbar für das Bewusstsein überhaupt und eben deshalb nicht vorfindbar für ein einzelnes Subjekt."

Professor Alexander* has given us weighty reasons for classing all contents of consciousness as physical, and limits the term psychical to conation, something identical throughout individual consciousness except for differences of "direction" corresponding to differences of content. Feeling is also by him provisionally classed with conation as psychical, although Stumpf's theory of "sense-feelings" (Gefühlsempfindungen) would, if proved correct, place these states also among things physical. Professor Alexander's theory, which I myself accept, introduces some difficulty into the current views of psychology, since it seems to limit unduly the scope of the science. It undoubtedly makes a purely introspective science still more demonstrably impossible than before. In return for this loss, however, it indicates the possibility that just as the quantitative science of physics has been evolved, by abstraction, from the physical material or content of sensation and perception, so a quantitative science of psychology may some day be produced, by abstraction and generalisation, from a study of the inter-relations of conative tendencies and more or less complicated intellectual abilities in the individual and in the race. It indicates, too, the true position of introspection in psychology. Before the objective science of physics could arise, sensations,

* "Mental Activity in Willing and in Ideas," *Proc. Arist. Soc.*, 1908-1909, pp. 1-40; "On Sensations and Images," *Proc. Arist. Soc.*, present volume, pp. 1-35.

perceptions, etc., had to be distinguished one from another and analysed into their common elements, *to a certain extent*. This process is identical, except as regards degree of difficulty, with the introspection talked about in psychology. Psychology is concerned with conative processes, which can be distinguished from one another by their contents, but of which a science can only be produced by reduction to the common terms of space and time in which physics has found it possible to work, *i.e.* by the measurement of external effects. A special method for investigating thus objectively and quantitatively the processes of consciousness will be briefly described at the end of this paper. Before leaving the present subject, however, it might be well just to remind oneself that the only so-called genuinely psychological measurement, namely, measurement of sensation-intensities, though definitely proved to be possible according to Delbœuf's scheme of "sense-distance," has received no application whatever in later psychology.

II.

It has been hinted just above that explanation can only be achieved in terms of space and time, the reason being that only in terms of these can quantitative relations between antecedent and consequent be expressed. The causal relations in physics, chemistry, and the other physical sciences are all actually or ideally quantified, and the mind can always pass continuously from cause to effect within some identical system of quantified relations. Psychical processes do not fit into any quantitative systems in this way, and hence the modern form of the causal concept does not apply to them. It is *not* because psychical processes are qualitatively distinct from one another that causal explanation in the ordinary sense is impossible,—physical processes present quite as well-marked qualitative differences—but constant quantitative relations, measurable in terms of space and time, are discoverable in physical science, whereas they are difficult to conceive as possible in psycho-

logical science. Time-relations, by themselves, are of course as readily measurable in psychology as in physics. The laws of memory and association, for example, are, so far as they are quantitative, laws of time-relations. The average time taken by one idea to call up another within a given system of ideas, the time saved in re-learning a series of nonsense syllables after a certain expenditure of time in learning them followed by an interval of time of definite length during which the mind is engaged elsewhere—these are instances in point.

This view of the nature of causal explanation is, of course, very far from being held by all or even by the majority of modern psychologists. Thus in December last we find Professor G. M. Stratton,* in his Presidential Address before the American Psychological Association, writing: "Our difficulty in conceiving mental objects to be *efficient* is largely due, I believe, to physics, with its specialised and rigid idea of causation. Rather than break with this authoritative idea, most of us would rather affirm that psychology can never hope to be an explanatory science. Yet we must remember that the exact marks which two events must display before we can regard them as cause and effect are themselves, for the most part, determined empirically. Our tests of the causal relation differ from time to time and from science to science. The idea of causality should normally be in a fluid state: only those of scholastic temper would have it crystallised. Psychology, like any other science, is free to modify the idea of causation to suit its own system of facts. Indeed, we have in something very close to Hume's account a conception to our needs. When we are ready to regard as causal any groups of antecedents that observation invariably discloses, then we are freed from the *a-priori* assumption that causes must always be physical. In our psychology we then become

* G. M. Stratton, "Toward the Correction of Some Rival Methods in Psychology" (President's Address), *The Psychological Review*, Vol. XVI, March, 1909, pp. 73, 74.

empiricists instead of *a-priorists*, and our method of explanation no longer carries an unnecessary load. We are ready to accept as a cause whatever on sufficient observation seems to be a cause."

I have quoted this passage in full because it is typical of much that is said and written by psychologists at the present day. In particular, views of the causal relation of this nature are often put forward in support of the theory of interaction of mind and brain. I prefer to leave the problem of mind and brain untouched (directly, at least) in this paper, although it is a philosophical difficulty arising quite definitely within the domain of psychology itself, and is one on which the theory that contents of consciousness are physical has definite bearing. What I wish to emphasise, however, here is that psychologists withdraw farther than they need from the physical conception of causation when they fall back upon Hume's doctrine of uniform sequence. Physical causation in modern science is uniform sequence *within a quantitatively-determined system*. May not psychical causation, if it really occurs, be regarded as uniform sequence likewise *within some system*? The system in this case, instead of being merely quantitative, would perhaps always be teleological. Such a view is, of course, widely held at the present day. Professor Münsterberg would say that it confused the standpoint of psychology with that of the *Geisteswissenschaften*. However this may be, it is, for scientific purposes, but a poor substitute for a quantitative system. Kant said long ago that a discipline contains so much of science as it does of mathematics, and even if we find, in the course of development of the sciences since his day, reason to doubt the complete accuracy of his statement, we should remember that the most prominent science in this respect, the science of biology, in which Darwin's researches produced a system in most apparent contradiction to Kant's dictum, is now at last beginning to achieve its full destiny in the form of "Biometry,"

or the quantitative study of variation and heredity. There seems to be very little doubt that a similar method, applied to the study of mental variation, will yield equally valuable results. It will be, of necessity, an objective method, using introspection as an "indicator" (*cf.* Karl Lange), but making all its measurements in objective terms.

Such a method would obviously form part of the system which is nowadays known as "functional" psychology, a system contrasted with the older analytic or "structural" psychology in being a psychology of mental operations rather than a psychology of mental elements, and in treating the mind as something "primarily engaged in mediating between the environment and the needs of the organism."* It would bear out Dr. McDougall's definition of psychology as "the positive science of conduct of the living organism."†

The enormous addition made to our knowledge of psychical process by the devotees of this system, comprising among other things the whole domain of animal psychology, indicates to what a great extent psychology as a science may advance independently of the solution it adopts of some of its most important philosophical difficulties. For although functional psychology is as a method quite consistent with the theory of psycho-physical parallelism, most of its adherents are, in fact, interactionists, while theorists who see in the distinction between mind and matter a false abstraction are equally capable of making use of all its results.

III.

The most serious problem of a philosophic nature which psychology has to face is undoubtedly the problem of knowledge. Important articles on this subject have recently been

* J. R. Angell, "The Province of Functional Psychology," *Psychological Review*, Vol. XIV, March, 1907, p. 85.

† Wm. McDougall, *Physiological Psychology*, Dent, 1905.

written by Mr. H. A. Pritchard* and Mr. H. H. Joachim† in *Mind*, and by Professor Dawes Hicks‡ in our own *Proceedings*, and an equally important reply to some of the difficulties thus raised has been made by Mr. T. Loveday.§ While it would be quite superfluous to repeat here, in however abbreviated a form, all the arguments advanced by the two sides in this controversy, perhaps the Society will forgive me for attempting to state once more, as concisely as possible, the central difficulty involved.

Knowledge, it is contended, cannot itself be an object in any sense in which other things are objects. In all cases of knowledge or cognition there are present the two distinguishable but inseparable aspects—process or act of cognising, and content or object cognised. What we know is always the *object* of our knowledge, which, as object, essentially involves the correlative subjective act of knowing. Consequently it is a contradiction in terms to suggest that this subjective act of knowing may itself be treated as an object. The danger inevitably arises that in the search for objects to form the material of its science, psychology may seize on the content in abstraction from the process and, by limiting its attention to the analysis of the former, “deprive it of the very feature which entitles it to be described as mental.”|| The result, for knowledge, is that psychology falls victim to a subjective idealism which makes knowledge, and therefore psychology itself as a science, impossible. The contents of consciousness being regarded not as the actual things known but as a sort of psychical screen or veil between the knower and the things which makes the actual constitution of the things themselves

* *Mind*, N.S., Vol. XVI, January, 1907.

† *Ibid.*, Vol. XVIII, January, 1909.

‡ *Proceedings Aristotelian Society*, 1907–08.

§ *Mind*, N.S., Vol. XVIII, April, 1909.

|| G. Dawes Hicks, “The Relation of Subject and Object,” *Proceedings Aristotelian Society*, 1907–08, p. 162.

something problematical and of no concern to psychology, there arises, on this assumption, the precisely analogous difficulty of justifying the direct knowledge of psychical processes as facts of the real world.

Such, in brief, is the criticism directed by the epistemologists against psychology. The more general form of the difficulty, as it affects the whole of mental process (not cognition only), was considered at the beginning of this paper. The view that contents of consciousness are all physical, if accepted, would make the danger of justly incurring it a less serious one, since there would on this view be less risk of forgetting that the content of consciousness cannot be abstracted from the process and considered by itself, if it is to be used to form part of the subject-matter of psychology. To any purely introspective system of psychology this criticism would be fatal. The process side of the process-content complex, never itself being an object, could only be experienced, never described. All description would have to be in terms of content, but these descriptions of content would not, as in physical science, be a half-way house to explanation. Explanation must be looked for within a wider system, dynamically in the adaptation of the individual to his environment, both mental and physical, statically in the relation of his various mental abilities to one another. These things can be expressed in numerical form and thus can provide us with a quantitative system, which we have seen to be an essential to science. The suggestion, therefore, with which Mr. Pritchard concludes his paper, to the effect that psychology should return to the study of "faculties," seems to me to be highly important. Such a course would correspond very closely, I imagine, with much of the work that is already being done in the study of mental abilities and of their inter-relationships (*Begabungslehre*). Mental activities are functions which may be defined and measured by their effects. For their study, introspection is essential but not sufficient. The most

mysterious of them, perhaps, viz. thought itself, is actualised in the individual under conditions and with results which can always be described and sometimes measured. From this point of view the criticism directed against the psychology of reasoning, to the effect that the latter explains in terms of mental imagery or mental symbolism, becomes irrelevant. "Imageless thought" has been admitted by psychologists for some years past, and recent experiments with well-trained subjects have only served to emphasise a difficulty that had already been realised by many.

An objective method which is quantitative and well suited for such a study of mental capacities or faculties as that just suggested is one referred to towards the beginning of this paper,* which I will now describe. Mental abilities are measurable in terms of their effects. If a single individual be taken, his several distinguishable abilities, sensory discrimination in sight, hearing, etc., memory for different classes of facts, etc., can be measured. If a second individual be similarly measured, he will be found, perhaps, to be superior to the first in some of his abilities, inferior in others. The inter-relations of the several abilities are, perhaps, of more interest than the measures of the abilities themselves, but they are different in the two cases, and would again be different in a third, fourth, etc. Not only, that is, do the abilities vary from individual to individual, but the relation between one ability and another also varies from individual to individual. The question at once suggests itself whether the variation from individual to individual, in the measure of one ability, is connected in any way, directly or inversely, with the variation from individual to individual in the measure of another ability. To put it quite simply: Does good ability in one direction tend, on the average, to be associated with good, moderate, or poor ability in another direction? The relation enquired after is one of concomitant

* P 66.

variation as exhibited in variable material, and a measure of the degree of concomitance is obtainable according to the methods of the mathematical theory of correlation, if a sufficiently large number of subjects are examined. Such a measure would represent the closeness of connection existing in general between one ability and another, and it is plausible to assume that this connection is the essential one, based on the nature of the abilities themselves, but that it is overlaid in the individual case by the other relations, which differ from case to case. The outcome of this line of thought might be that we could regard the mind as a system of inter-related abilities, which would lend itself to quantitative as well as to qualitative description, and ultimately form a basis on which a start might be made to build an all-inclusive explanation of man and his environment.

Whatever the difficulties in the way of such a theory, it is at least certain that the problem of mental variation will have to be faced in psychology, and in doing this, objective measurements will have to be made and the mathematical theory of correlation applied. The method, as we have seen, has the merit of being free from the epistemological difficulties with which purely introspective psychology is beset.

IV.

It may be objected at this stage of the discussion that the accepted definition of psychology as the science of conation stultifies our demand for a quantitative system, and, moreover, that the brilliant work of Professor Stout, Mr. A. F. Shand, Dr. McDougall, and others demonstrates the possibility of a genuinely explanatory though non-quantitative scheme. Instead of the mechanical connection of physical science, we have here the teleological connection of conative processes, which seems to be essentially free from limits of mathematical determination. This is, however, at best only half the truth. The internal energy of conation, if one

may be allowed to use such a phrase, may seem to be a variable and indeterminate quantity, but it is nevertheless a quantity definitely confined within certain limits. Its variations cannot transgress certain fixed bounds. These limits of variation, both in the individual and in the race, can, theoretically at least, be measured with mathematical precision, and the nature of the variability can also be exhaustively determined,—in objective terms, of course.

There seems to be some reason for believing that it was measurement that produced science, and not science that gave rise, in the course of its development, to the method of measurement. At least, I think I see a sign of this in the case of physics, which may explain the general tendency of psychologists to regard sensation as psychical. It is shown, for example, in the line of argument which the late Professor Ebbinghaus adopts in his attempt to distinguish sensation from physical fact.* He argues, in effect, that the two must be distinct because the same physical fact or law can be discovered and verified through the mediation of *different* groups of sensations; for example, the laws of the refraction and dispersion of light by a glass prism might be determined in terms of the colour-sensations aroused in the observer's consciousness, or again, in terms of tactile sensations, if the retina be replaced by a surface sensitive to light, connected with a special form of apparatus. Similarly, the physical law of the velocity of propagation of sound in air might be determined with an arrangement of apparatus in which the ear of the observer is replaced by a manometric flame, which indicates the arrival of the sound-waves in visual terms. While this argument quite fails in its aim of proving that sensations are psychical,—for it only shows that sensations supplement one another in a larger whole—it puts in a clear light the distinction between the physical of direct

* *Grundzüge der Psychologie*, zweite Auflage, Leipzig, 1905, p. 3.

experience and the physical of the science of physics. The latter is essentially a system of quantitative relations, which has resulted from the direction of the attention primarily towards the measurable aspects of objects. In this case, measurement preceded and produced the science. Correspondences and proportions obtained a predominance which soon became transformed for thought into that hypostatized abstraction, the "matter" of the physicist. The distinction between primary and secondary qualities is methodological, not metaphysical. Moreover, it is not limited to the "given" in sensation and perception. The contents of the so-called higher mental processes, imagination, memory, even abstract thought, have also formed part of the material in which the distinction is made. As Professor Alexander has shown us by other arguments, they are equally physical with the last. Physics has already co-ordinated to a certain extent *all* the various forms of experience-content, or, to use a more suitable expression, objective fact. Nerve-physiology supplements the account in many ways. Psychology only remains within its proper sphere so long as it limits its attention to the individual processes of conation (and feeling) which form a system of mental directions corresponding to the various physical objects with which from moment to moment they are compresent. Only so far as the differentiation of the object indicates a correlative differentiation of the conation is the former of strictly psychological interest. Apart from the facts of illusion and error, which are dependent on what Professor Alexander calls the personal (*not* the subjective) factor in experience, the objective universe is simply the sum of its various "appearances" (actual and possible) to different individuals. Thus it is a very real objection to presentationism that it counts the same thing twice. The difficulty stands out most clearly in the discussions generally given in the text-books on the relation of mind and brain. In most of these discussions the subject-object relation is allowed, for the

time being, to fall into the background, and the impossible task is set of bringing into relation two distinct series of entities, viz. psychical contents and physical processes, which have previously been *made* completely disparate from one another by a perfectly gratuitous process of abstraction. As I said before, I do not intend to consider this problem in detail here, and therefore will content myself with this brief indication of the difficulty and of the direction in which its solution may be sought.

Among psychological problems of a more special kind there are two which run some risk of being incorrectly set by a psychologist not fully alive to the pitfalls of epistemology. These are (1) the problem of association of ideas, and (2) the problem of attention. On both points a great deal has been written in recent years, and there seems to be no need here for more than a passing reference to them. In both cases the danger has lain in an inadequate appreciation of the nature and significance of the subject-object relation.

IV.—KANT'S ACCOUNT OF CAUSATION.

By A. D. LINDSAY.

EVERYONE is aware of the important place which the account of the principle of causation plays in the Critical Philosophy. It was Hume's criticism of the principle which first directed Kant to the main problem of the *Critique*. Kant explains, of course, that he saw that criticism to be of more general application, and he treats Causation as only one of a system of categories or principles all involving the general problem of the possibility of synthetic *a priori* judgements. At the same time he bestows more attention on and refers more constantly to the principle of causation than any other.

In spite of this there is still very great difference of opinion as to the real purport of his treatment of the subject—even more as to its value, and it is perhaps worth while to make an attempt to explicate it. The first essential in Kantian criticism is to determine as clearly as possible how the question at issue presented itself to Kant and what he himself thought that he had proved. Thus only can we really determine the value of his answer. Now it is not at all easy to do this, in reading the account of causation in the *Analogies of Experience*, and some misunderstanding of Kant's position has arisen, I think, from a too exclusive attention to this passage. I propose in this paper to examine first other important passages in which Kant deals with causation, from which I think we can see what he considers established in the *Analogies*.

There are in that passage at least two obvious difficulties: firstly what exactly is Kant's meaning in insisting that causation holds only of phenomena—how does that affect his proof? and secondly, what is the relation between the *a priori* principle of

causation and any empirically discovered causal law? The former point is discussed at some length in the *Dialectic* in the solution of the third antinomy. There Kant explains the compatibility of causation and freedom by the distinction between phenomena and things-in-themselves, and makes clear what that distinction comes to so far as causation is concerned. The second point is elucidated in the *Critique of Judgement*, firstly in an important passage in the Introduction, where Kant insists on the distinction of the general *a priori* law of causation from all empirically discovered laws, and secondly in the *Dialectic* of the *Critique of Teleological Judgement*, where he explains that the two principles of mechanism and teleology are merely regulative principles of interpretation of the general *a priori* principle of causation. I propose to notice the contribution made by these passages to the question: What did Kant think he had proved in his account of causation?

The second of these two difficulties raised is the simpler and may be taken first. Kant's answer to it is contained in a passage in § 5 of the Introduction to the *Critique of Judgement*, which is worth quoting in full: "Looking at the grounds for a possibility of experience, we find in the first place something necessary, namely, the general laws without which nature in general, as object of the senses, cannot be thought: these rest upon the categories applied to the formal conditions of all perception possible to us, in so far as that is given *a priori*. Under these laws the faculty of judgement is determinant. It has nothing to do but to subsume under given laws. For example, the understanding says: Every change has its cause. That is a general law of nature. The transcendental faculty of judgement has nothing to do but to give *a priori* the condition of subsumption under the concept which has been laid down. That condition is the succession of the determinations of one and the same thing. Thus for nature in general, as an object of possible experience, that law is recognised as absolutely necessary.

"But the objects of possible experience, besides this formal conditioning in time, are further determined, or as far as can be judged *a priori*, determinable in many different ways. Thus specifically different natures, besides what they have in common as being generally part of nature, can further be causes in an infinite variety of ways: and each of these kinds of causation (so the general concept of cause requires) must have its rule, which is law and involves necessity. At the same time, from the constitution and limits of our understanding we have no insight into this necessity. We must, therefore, in nature, in respect of its merely empirical laws, think a possibility of an infinite variety of such laws, which for our insight are accidental, *i.e.*, cannot be known *a priori*, and in respect of these we regard the unity of nature according to empirical laws and the possibility of the unity of experience as a system of such laws, as accidental."

Kant's amplification of this passage makes it clear that there are for him three stages of generality in causation. At the one extreme we have the general law of causation—all changes take place according to the law of connexion of cause and effect. This he calls an *a priori* and constitutive principle, and it is with this alone that the argument in the *Analogies of Experience* is concerned. At the other extreme come the empirical laws of causation discovered by observation of particular conditions and circumstances. Between them comes the principle with which the *Critique of Judgement* is more particularly concerned. It guides science in its attempt to reduce to a unity the manifold of particular laws. It is, in Kant's language, *a priori* and regulative: what we now call a postulate. We are to try it as far as it will go, but we do not, and cannot, know beforehand how far the multiplicity of natural laws can be simplified. It is not a principle which we *prescribe* to nature, because, in Kant's words: "Reflection over the laws of nature directs itself according to nature—not nature according to the conditions under which we try to obtain from

nature what is, in this respect, a quite accidental concept." This principle is described in the Introduction as the principle of the purposiveness of nature for our understanding, and in the *Critique of Teleological Judgement* Kant explains that the principles of mechanism and of teleology are both applications of this general principle. With the relations of these principles we are not now concerned. What has to be noticed is that from the general and universally valid principle of causation we can make no deduction as to what causes what in any particular instance, and can only make suggestions towards the principles which are to guide us in our search for further unity among the empirical laws derived from our first study of nature. All that is a matter for empirical science to study, with what success it may, guided only by regulative principles. All degrees of success or failure in its task are quite compatible with the absolute validity of the general principle of causation.

This distinction of the *a priori* constitutive law which prescribes to nature, and the regulative principle which follows nature, is the distinctive feature of Kant's treatment of the subject. He both strongly asserts the validity of the *a priori* principle and strictly demarcates its limits. In discussing his account of causation, we must examine with some care how such a distinction is possible, and, further, what kind of relation exists between the principles so distinguished.

Let us turn now to the discussion of the third antinomy. The relevant passages are numerous and well known, so I content myself with noting the salient points in the discussion.

The antinomy between causation and freedom springs, according to Kant, from the nature of causation itself. It is not a conflict between an intellectual and an ethical principle, but rather between the assumptions and the consequences of the principle of the understanding. The argument practically is that change is unthinkable without spontaneity and unknowable with it.

Kant, it is well known, argues that the distinction between

phenomena and things-in-themselves offers a way of escape from this dilemma, enabling us to regard both sides of the antinomy as true, but in different spheres, and in accordance with this argument he urges the compatibility of causation and freedom in the same action.

Properly to answer the objections which have been raised to this argument would involve a discussion of that much debated point, the real nature of Kant's critical idealism. That would be too large an undertaking here ; but it is important to notice how Kant represents the distinction as affecting the principle of causation. The antinomy, he says, rests on the argument "that, if the conditioned is given, the whole series of conditions also is given." This holds, he asserts, in so far as we are talking of "things as they are, without asking whether and how we can arrive at the knowledge of them." But in predicating cause, the conditioned is given in perception, and is related to a condition also given in perception, and so on ; but the whole of *such* a train of conditions can never be given in perception. "Phenomena require to be explained so far only as the conditions of their explanation are given in perception ; but whatever may exist in them, if comprehended as an absolute whole, can never be a perception. Yet it is this very whole, the explanation of which is required in the transcendental problems of reason."

From which it follows, that when we try to think of what is implied in the nature of reality as a whole, we cannot build it up, or regard it as built up of the separate discrete phenomena which the understanding distinguishes in perception and joins according to the principle of causation. The point of the distinction between phenomena and things-in-themselves is that the understanding only deals with what is perceived ; whether what is perceived is mental or non-mental, in or out of mind, has nothing whatever to do with it. As Kant says : "It is possible experience alone that can impart reality to our concepts." Or again, "Nothing is really given to us but perception, and the empirical progress from this to other possible perceptions."

This point is put most clearly at the end of §6 of the *Antinomy of Pure Reason*.

"Thus we may say that the real things of time past are given in the transcendental object of experience, but they only are objects to me and real in time past, on the supposition that I conceive a regressive series of possible perceptions (whether by the light of history or by the vestiges of causes and effects), in one word the course of the world, leads, according to empirical laws, to a past series of time, as a condition of the present time. It is therefore represented as real, not in itself, but in connection with a possible experience, so that all past events from time immemorial, and before my own existence, mean after all nothing but the possibility of an extension of the chain of experience, beginning with present perception and leading upwards to the conditions which determine it in time."

"The cause of empirical conditions of that progress, and consequently with what members or how far I may meet with certain members in that regressus, is transcendental, and therefore entirely unknown to me. But that cause does not concern us, but only the rule of the progress of experience, in which objects, namely phenomena, are given to me."

From these and other passages we can see that the distinction of phenomena and things-in-themselves is important for the account of causation, because it is concerned with the distinction between perception and the understanding.

The use of the understanding in knowledge presupposes perception, and refers back to it. The understanding, acting according to the principle of causation, is concerned only to discover "rules in the progress of experience." The understanding, therefore, can never explain change, but, given perceived change, it can and does discover rules in that change, and in so far as it discovers rules, can anticipate perception. But the movement of thought is always from perception to perception: it is concerned with "the empirical progress from this to other possible perceptions." Any account of the implications of

causality which supposes that in progress of knowledge all account of mere matter of fact will be eliminated, and that all reality will be deducible from one principle, implies that knowledge in time will be able entirely to transcend perception: that the distinction between understanding and perception is one of greater or less clearness of thought. This seems to be implied, for example, in the statement of Du Bois Reymond, quoted by Bergson in *l'Évolution Créatrice*: "One can imagine knowledge of nature to have reached a point when the whole process of the world would be represented by a unique mathematical formula, by one single immense system of simultaneous differential equations, from which could be deduced for each moment the position, the direction, and the swiftness of each atom of the world."

Such a system would, of course, be incompatible with freedom, but it would also, Kant holds, and surely rightly, be unintelligible. For on what could such a system of differential equations be based? Surely in the end on observed successions; and while many observed successions are analysable into a system of effects, these effects themselves must in the end be only observed successions. So that if perception goes, there is no basis for the calculations, and if it stays, the basis of any particular law of causation will be mere observed matter of fact—*this* is seen to change into *that*. How it changes cannot be explained. We can only describe what can be observed. Causal connexion rests, therefore, in the end on observed sequence—a sequence which, as Kant says, remains in the end for our insight accidental or, as he calls it, in the antinomy, spontaneous.

This can be seen more clearly if we look at any application of causation. We say that the change is determined by a rule. But of what nature is the rule? Must it not always be of the nature A becomes B? But how are A and B known except through perception, and in perception are not all A's and B's unique? Just as in the application of a mathematical proposition to actual measurement, we must say *in so far* as this is

a plane figure bounded by three straight lines, *in so far* will its angles be equal to two right angles ; so in the application of a rule of causation must we not say that *in so far* as two causes are similar they will have similar effects ?

This may seem an unwarranted interpretation of Kant's distinction between phenomena and things-in-themselves ; but I think that an examination of the discussion on the third antinomy will show that there, at least one implication and that the most important, of saying that knowledge is confined to phenomena, is always that the concepts of the understanding refer only to what is perceived ; and we are making the mistake of dealing with phenomena as things-in-themselves when we construct an ideal of knowledge which would render all reference to perception unnecessary.

Such difficulties as there are in Kant's account seem to lie in his view of perception as consisting in a series of separate phenomena to be synthesized rather than a continuum broken up and connected again by thinking, which is part of a general confusion between perception in the sense of perceiving act and of perceived object. Insisting that causality is only concerned with perceiving acts and not with what is perceived, does not solve any problem, as Mr. Prichard has conclusively shown ; but it is an important element in knowledge that the understanding connects those elements in the perceived continuum which *we* have discriminated, *i.e.*, is a synthesis of our representation.

The effect of this confusion may be traced in Kant's working out of the relation of causality and freedom, but it does not, I think, invalidate the general importance of the distinction of perception and understanding as a solution to the antinomy. From this point of view justification may be found for Kant's statement of the compatibility of causation and freedom. All that the law of causation demands is that spontaneity or freedom cannot be known in the synthesis of experience. But if in all applications of causation the

principle is that in so far as the object is like other objects it has the same cause, causality will not apply in so far as the object is unique. Human action is not subject to the law of causality in so far as in action the agent is conscious of himself as an individual. When he comes to describe his or anyone else's actions, he can only do so in terms of their likeness to other actions, and in so far as they are regarded as like other actions they have the same causes and effects. But a discussion of this very difficult question must be reserved. It is time now to examine the account of causation in the *Analogies of Experience*, taking from the passages examined these two principles :—

(1) That the a priority of the general principle of causation is compatible with the discovery of particular laws of causation being empirical. In Kant's words : "In natural science we have an infinity of conjectures with regard to which certainty can never be expected, because natural phenomena are objects given to us independent of our concepts, and the key of them cannot be found within our own mind, but in the world outside us."

(2) That the restriction of causality to phenomena, whatever else it may mean, at least means that the principles of the understanding are only valid for the world of perceptive experience, that they presuppose and can never do without perception. The principle of causation, if taken by itself without perception, leads to antinomies, and may well be found to be unintelligible.

Do we find in the *Analogies of Experience* proof offered for the validity of a principle of this kind ?

Kant begins by insisting on a distinction between the mathematical and the dynamical principles of the understanding. The mathematical principles are concerned with synthesis of the homogeneous : the dynamical, on the other hand, are concerned with the synthesis of the heterogeneous, and are therefore, as compared with the former principles, regulative. The difficulty of the problem of causation, therefore, is to under-

stand how we can lay down a principle which will hold of anything in experience without being at all able to specify what we shall experience. These, then, are the limits within which the problem is to be solved. We cannot anticipate the heterogeneous, we can only anticipate what is homogeneous with our present or any other experience, and that according to Kant can only be the general conditions of determination in time. We cannot anticipate what will be determined in time: we can anticipate what any determination in time will involve. We find Kant, therefore, beginning by laying down with regard to all the analogies of experience "This synthetical unity in the time relations of all perceptions, which is determined *a priori*, is exposed therefore in the law: that all empirical determinations of time must be subject to rules of the general determination of time."

In accordance with this, Kant begins his proof of causality by assuming the distinction between succession in our acts of apprehending and succession in the object apprehended. That is presupposed in any perception of change, and it involves that "the phenomenon, in contradistinction to the representations of our apprehension, can only be represented as the object different from them, if it is subject to a rule distinguishing it from any other apprehension, and necessitating a certain kind of conjunction of the manifold." In other words, all objective determination of time involves our "transferring the order of time to the phenomena and their existence, and assigning to each of them, as to a consequence, a certain *a priori* determined place in time, with reference to antecedent phenomena, without which place phenomena would not be in accord with time, which determines *a priori* their places to all its parts."

But time in itself can determine nothing. Change is not determined *by* time, only *in* time. But in causation we are not dealing with objects as though their time and space relations constituted their nature, but as though their several natures or characters determined their time and space relations. Time

and space relations in themselves would be nothing, and there would be no order or succession in time unless different things occurred in time, and so the whole order of time seems to depend upon the particular specific character of the objects. The experience of change thus involves the distinction between succession in acts of apprehension and apprehension of succession: that in turn involves that the succession is determined, *i.e.* that there is some reason for the distinction; but the determination cannot come from the succession in apprehension nor from a relation to time in general, but from the character of the successive objects. Kant can, therefore, conclude "that something happens is a perception which belongs to a possible experience, and this experience becomes real when I consider the phenomenon as determined with regard to its place in time, that is to say, as an object which can always be found, according to a rule, in the connexion of perceptions."

We may, therefore, have no *a priori* information about particular causal laws, but we can say beforehand that whatever change we experience it will be determined by the character of what precedes it. We have thus a general law of causation independent of the particular empirical laws which are to be discovered in experience. That was the first point we noticed in the other passages on Causation.

The second point was that causation always referred to perception. Examination of the analogy will, I think, show that this is vital to Kant's account of causation, and, further, that it is through the reference to perception that we can understand the relation of the general principle of causation to particular empirical instances. We must also be prepared to find a certain confusion coming from the ambiguity we noticed in the meaning of phenomena.

The necessary reference of causation to perception comes out in Kant's account of the law of continuity in all change. He cannot, he says, understand a change from A to B as

a sudden change. It can only be understood as the result of the continuous action of causality through a certain time. In that time A must be represented as passing through all the infinite degrees between A and B as there are an infinite number of possible stages in a given time taken by the whole change from A to B.

It is here, I think, that we have the real difficulty in Kant's account of causation. If it means that it is impossible to understand A becoming B, but it is possible to understand A becoming A₁, A₂, etc., then surely the contention is wrong. The one is as impossible to understand as the other. Kant sometimes speaks as though our perception of the continuous was really built up of discrete moments. In so far as he falls into subjective idealism and thinks of phenomena as apprehending *acts* in their nature discrete, he must think the discrete apprehending acts as coming first and the continuous change as being somehow made up of them.

But another interpretation of this passage is possible. The change from A to B, if objective, involves that A determines B. Yet that change involves a certain time, and further discriminations may be made in that time, answering to which discriminations must be different determinations of the change between A and B. This involves that, instead of the notion of change being built up of a series of discrete states, we begin with continuous change, which we perceive: what we are doing in causation is to connect the states which we discriminate in this continuous process. This may be what Kant means when he makes causality a rule of "empirical determinations of time." This view of change is surely right. If we ask how we ever came to think that one thing changes into or causes another, the answer is because we actually see it becoming the other. We are apt in discussing causality to talk as though it were an inference derived from an observation of differences at different and discrete moments: that is, as though we first saw A, then, so to speak, shut our eyes or left the room, and coming

back and finding B, said A must have become B. This is the sort of case provided for in canons of induction. But it is well to recognise that in those cases we always infer from an observation of two or more discrete stages in a process of change to a process which we regard as continuous, and we can only do that because we are always actually observing continuous change. If our experience were as atomistic as Hume describes, if we had to wait for the synthesis of the understanding or of our apprehension, to apprehend a continuum, Hume's account of causality would be true. But causation has meaning only with reference to the perception of change. We could not understand or think change unless in an indivisible present we perceived change. Causality in itself, therefore, does not explain change: it presupposes our perception of it, and any theory of causality which tries to dispense with this reference to perception becomes unintelligible. We get no nearer explaining change in itself by breaking up any change into a series of smaller changes. That is only an attempt to follow more closely and determine at more points the continuous perceived process which is implied all along. If this is what Kant means by saying that causality is confined to phenomena, he is surely right. He only gets into difficulties when he represents phenomena, as he sometimes seems to do, as built up of discrete acts of apprehending. But with the difficulties which this involves, I am not concerned. I wish rather to show how, in insisting on the importance of the distinction between understanding and perception, Kant makes possible an intelligible theory of causality.

I said that this distinction would explain the relation of the general principle of causation to particular empirical instances. This, of course, is not specifically within the scope of Kant's enquiry in the *Critique of Pure Reason*. It is rather the problem of the *Critique of Teleological Judgement*.

The general principle of causation has established that if change is real, it is determined by the character of the pheno-

menon. We cannot from that anticipate the nature of the phenomena, but we can anticipate that empirical laws of causation will hold of phenomena in so far as they are similar. Because objective change is determined by the character of its antecedents, similar antecedents will have similar consequents. This does not imply at all that cause and effect are identical. For, inasmuch as the law of causation rests on an observed continuous change, the cause and the effect cannot be equal. Inasmuch as that change is determined by the character of the phenomena, phenomena of like character will change in the same way, and a cause must be like another cause to have an effect like that other cause's effect.

What of the empirical laws themselves? May we not suppose that in the end their multiplicity is reducible, that they are stateable in terms of one simpler law? This involves that effects which seem disparate in quality may be analysable into different combinations of the common simpler elements. Science does so analyse what seem at first simple phenomena, but, it must be noticed, the extent to which this can be done is quite undetermined. We can only say *a priori* that it cannot be done altogether without making change impossible and destroying that very reference to the perceived change of one thing becoming another on which causation is based: that, therefore, we shall be left in the end with rules of causation resting on observed fact, and that we come to rules which are not further analysable when we come to perceived wholes which cannot be regarded as made up of the addition of simpler elements.

This same point comes up in relation to another form of the same difficulty. Any account of causation which leaves a number of empirical rules or talks of "one thing becoming another" implies that the continuous change perceived can be divided up into independent states. Does not this involve an unreal separation, and ought we not rather to say that each change is caused by the whole previous condition of the world?

This view sounds plausible at first, but observe its consequences. If everything causes everything else equally, then the difference in the nature of things we perceive or, to speak more accurately, the differences undoubtedly discernible in different moments in the continuous whole of what we experience, are of no effect in determining order in time. The order of events in time is determined thus as it would be as if everything were homogeneous. But if everything were homogeneous there would be no events, no time. Therefore if everything does not cause everything else equally, some things are more closely related to some than to others: and if they can be related to one another they can be distinguished from the rest. Causality implies both similarity between cause and cause and the possibility of isolating cause and effect. It is because this isolation is only partially possible, that particular laws of causation are not absolutely certain; but if it were absolutely impossible, there could be no change.

These considerations may help us to see how Kant could call the principles of mechanism and teleology regulative principles of the application of the general law of causation to particular instances. Granted that in objective change the present is determined by the past, if we could see a changing object in entire isolation, the last state of the object would be all our present and the first state all our past. The last state would therefore be completely caused by the past and yet as an observed change be different from it. We should thus have thoroughly established an instance of causation, but it would be causation not in virtue of a rule, but in virtue of the character of the antecedent state. That would be a sufficient determination of the consequent. Science is always trying to effect such isolation, and the difficulties of discovering causal laws are largely difficulties of isolation. But if the certainty of a causal connexion depends upon the relative isolation of the changing object, causation involves the problem of individuality and, hence, teleology.

On the other hand, causation observed in an isolated

instance gives rise to a causal law, in so far as other things are found to be like the observed instance. It becomes the aim, therefore, of science to discover, by analysis or observation, things of the same nature as the observed antecedent. In so far as it is successful, in so far will the particular causal law hold. Neither of these two conditions, of course, can be fulfilled with absolute accuracy. (Things are not entirely isolable and they do not repeat themselves.) But it is only in so far as they can be fulfilled at all that change can be understood. The validity of the law of Causation is not affected by the fact that it is applicable only under conditions which cannot be rigorously fulfilled, any more than a geometrical proposition is proved to have exceptions because no actual lines can be proved to be exactly straight. But as the geometrical proposition can be applied to the measurement of an area in so far as that area can be regarded as a plane surface in which straight lines can be drawn, so causation can be applied to the world which we perceive, in so far as that world is a whole in which the elements are separable and some of them similar: a whole whose elements are neither entirely homogeneous nor entirely disparate. But either entire homogeneity or entire disparateness would make experience impossible. Hence the conditions of the applicability of the principle of causation are conditions of the possibility of experience, and we have an *a priori* principle of causation which is compatible with the empirical nature of particular causal laws and with the existence of spontaneity.

V.—BERGSON'S THEORY OF INSTINCT.

By H. WILDON CARR.

INSTINCT and intelligence, in Bergson's view, are two modes of psychical activity that are completely different from one another in the method of their action on inert matter. Both faculties endow their possessors with knowledge, both are created by evolution for the purpose of advancing the activity of life, but they are not derived nor evolved the one from the other, nor are they stages in one process; on the contrary, they mark divergent directions of the evolution of animal consciousness, just as the animal and vegetable mark divergent directions of the original evolution of life. The fact that there is a knowledge which differs in its nature from that of our intelligence, which accomplishes its life purpose in a quite other way and by quite other means than the way and the means by which our intellect works, is the main positive evidence that life is more than intellect, and that intellect serves the practical purposes of life. In instinct and intelligence we have two kinds of knowledge, in their nature independent of one another, in their existence completing one another.

If this view be true, it gives rise to an interesting problem as to the nature of knowledge. In this paper I shall confine myself to the purely philosophical aspect of the problem, any questions of science that I may refer to will be for purposes of illustration only. There are scientific questions of great interest involved in the theories of the origin of instinct, such as those that are being debated by neo-darwinians and neo-lamarckians. These I shall not deal with, my purpose being

to direct attention to the nature of instinct and intelligence in relation to theory of knowledge.

Why does the intellectual attempt to represent reality involve self-contradiction and inconsistency? I need not turn aside to prove that it does so, the problem is a common-place of philosophy ancient and modern. The answer that Bergson gives is that the intellect, using the term in its usual meaning as the faculty of discursive thought, cannot comprehend the reality that is life. Life is movement, change and becoming, the understanding can only represent movement, change and becoming by partial views. It represents change as a succession of states each in itself unchanging, movement as the succession of positions of an object in each of which it is at rest, and becoming as a merely external alteration of being or as a relation of being and nothing, and all these representations involve logical self-contradictions. Life is a pure becoming and the categories of the understanding fail to represent it. But what other knowledge have we but that which our intellect supplies? The answer of Bergson is that the intellect is not commensurate with life but is a kind of luminous nucleus surrounded by a fringe of intuition. This intuition is of the nature of instinct.

If it be objected that there can be no knowledge that is not intellectual, because intellect is simply the name for the faculty of knowing, that whatsoever is or can be known is from the fact of knowledge alone, intellectual, and that consequently the term intellect must include the fringe as well as the nucleus of knowledge, the reply is, that we can use the word in this sense if we wish, but that in so doing we widen the ordinary meaning of the term. If, on the other hand, we confine it to the faculty of attributing a predicate to a subject, of making our experience enter into forms and categories, in a word, to the faculty of discursive thought, then it certainly does not include the fringe of intuition. Whether it is rightly

described as intuition is a question we may for the present reserve. Whatever its nature, undoubtedly we cannot think of it without bringing it under our categories, but it exists for us before we think of it, and also it exists as a something more beyond the categories. It escapes our intellectual categories by reason of the richness of its content and its indivisibility. It is, in Bergson's theory, the life which is more than thought.

When we consider the forms of life around us and try to read the history of the evolution which has produced them, we are able to make out the broad lines along which evolution has moved. The evolution of life is not a movement in a straight line or in one direction only, like the course of a cannon ball, to use one of Bergson's illustrations, but rather resembles the explosive movement of a bursting shell whose fragments may be thought of as themselves shells growing, moving and bursting in their turn. This view is now generally recognised by science, so far as regards the forms of life and the evolution of species. The great divisions of life, the vegetable and animal kingdoms with their subdivisions are no longer regarded as successive stages of one evolution but as the various directions which the activity has taken. But although recognised with regard to forms and species it is by no means admitted with regard to the powers of consciousness that those forms have manifested. The chief error, according to the theory I am now describing, that has vitiated the greater part of all philosophies of nature from Aristotle onwards, is the view that in vegetative, instinctive, and rational life, we have three successive degrees of the development of one and the same tendency, instead of three divergent directions of an activity that is split up in growing.

Of the two great divisions of the animal kingdom, the invertebrata and the vertebrata, instinct seems to have reached its highest development in the former, intelligence in the

latter. It is in the hymenoptera, the ants and the bees, that we meet with the most perfect examples of instinct. In these creatures evolution seems to have produced a perfection of instinct as it were by a leap, so great seems the distance between the powers of these and other insect species. And just in the same way in the vertebrata it is only in man that we meet with pure intelligence, and man in this respect stands as high above the other vertebrates as the ants and bees stand high above other insects. Life seems to be limited in its powers of evolution in a way that is difficult to understand or explain. The fore limbs of the vertebrata, for example, undergo apparently any modification that a species finds advantageous, they take the form of fins or wings, or legs or hands, or they may suffer complete atrophy as in the snake, but they remain always modifications of one pair of fore limbs, evolution never duplicates them, life evolves along a fixed type. It seems to us as if wings and hands, for instance, would be more advantageous to a species than wings only or hands only, or at any rate worth trying, but evolution seems to be able only to give us hands⁶ or wings. The same limitation seems to be manifested with regard to instinct and intelligence. Intelligence seems never to evolve along with instinct, nor instinct along with intelligence, the evolution of each proceeds as though the two were incompatible. In popular language we often confuse the terms, we speak of the intelligence of ants and bees when we mean their instinct. If these creatures possess intelligence in the sense in which we possess it, it probably is to them but a fringe that surrounds their instinct. It is not only in the invertebrata that we meet with instinct, nor is it at all probable that intelligence is confined to the vertebrata, but the main direction of evolution has been in the one towards instinct, in the other towards intelligence. In each case the evolution is accompanied by a correspondingly increased complexity of nerve structure.

We may best approach the consideration of the characteristics of instinct and intelligence by taking typical examples. From those that Bergson has cited we may choose as an illustration of instinct the power of paralysing its victims that is possessed by certain species of wasps. These insects lay their eggs in the bodies of spiders, beetles, or caterpillars, the victims continue to live for the number of days necessary to provide the fresh food that the wasp larva requires, having first been paralysed by the wasp by means of a very skilful surgical operation. The paralysis is produced by stinging exactly on the nerve centre that controls locomotion and on that alone. The various species of paralysing wasps are governed in their action by the nature of their prey, the sting being given in one, three, or nine points, according to the number of locomotive centres. Complete paralysis without death is thus produced. It seems to us as though these creatures surpassed in their knowledge the most learned entomologist and in their skill the most expert surgeon, and yet by no possibility can we imagine that the knowledge and skill has been attained in the same or in an analogous way to that of the entomologist and the surgeon. In fact, we recognise at once that the knowledge and skill shown by the instinct is in every way opposite to the knowledge and skill shown by an intelligent being. The insect has had no experience, yet its activity is guided unerringly. It has, on the other hand, no power of varying its activity, no power of choice, no power of acting according to circumstances. An intelligent being gains knowledge by experience, and skill by painful effort. The creature directed by instinct has perfect skill without effort, and is not dependent on experience. A baited trap for insects is as effective the hundredth time it is set, as the first, but a baited trap set for creatures that possess intelligence rapidly becomes useless.

We meet with pure intelligence only in human beings, and therefore only in the study of human nature do we discover its

distinctive marks. Other beings that seem to us to possess intelligence, and through which, at any rate, we think we can trace the evolution of intelligence, possess it as compared with ourselves in an almost infinitesimal degree. Let us compare, then, with the illustration we have just given of instinct, an illustration of what invariably is a mark of intelligence. If we discover in a river deposit or in an old cave dwelling, a worked flint, we never doubt for a moment that we have before us the work of an intelligent creature. If we have independent evidence of the age of the deposit, we argue at once that at that time and in that place there lived a human being. If we are convinced that the object has been artificially produced, we are never a moment in doubt that the artificer was human and intelligent. A worked flint is not a natural object, made use of for a special purpose, but an object worked to adapt it to serve various purposes as circumstances dictate, and it has been worked into shape by other objects used as tools to make tools. "Intelligence, represented in what seems to be its original demarcation, is the faculty of manufacturing artificial objects, in particular of tools for making tools, and of varying indefinitely the manufacture." (*Evolution Créatrice*, p. 151.)

What, then, are the characteristics which especially distinguish the two faculties? In comparing them we may set aside all questions as to whether one is superior to the other, or has been evolved from the other, or has originated independently of the other, and regard both as products of the evolution of life. Also, we may set aside the question as to whether or not both are means only of serving life, or whether one, at least, is an end and not merely a means, for it is only as means, not as ends, that it is possible to make a comparison. Considered, then, as products of the evolution of life and as means of serving the activity of life, what are their distinguishing features? A distinguishing mark of intelligence is the making of tools. The possession of tools is common to instinct and intelligence. It is in the nature of the tools and

the manner of their use that the distinction between them lies. The tool or instrument that an animal directed by instinct possesses, forms part of its bodily structure, or is organically connected with it, and corresponding to the instrument is the instinct which informs it. If we compare perfect examples, a case of pure and perfected instinct such as we meet with in ants and bees, and a case of pure intelligence as we meet it only in human beings we find between them this essential difference, the perfect instinct is a faculty of using, or it may be of constructing organic instruments, the perfect intelligence is a faculty of constructing and using inorganic instruments. The advantages and disadvantages of the two modes are obvious. Instinct finds itself possessed of an instrument self-made and self-maintaining, which combines an infinite complexity of detail with an absolute simplicity of function, and which performs at once and without difficulty, at the right moment, the work it is called on to do. On the other hand, it is an instrument which preserves a structure almost invariable; any modification of it carries with it a modification of species. Instinct is therefore necessarily specialised, being the utilisation for a determinate object of a special instrument. Intellect, on the other hand, uses tools that are very imperfect instruments, but as those tools are formed of inorganic matter they can take any form whatever, serve any purpose, draw the living being out of any new difficulty that arises, and confer on it an unlimited number of powers. Inferior to the natural tool for the satisfaction of immediate wants, the artificial tool has the more advantage the less pressing is the need for it. Above all, it reacts on the nature of the being which has made it, for in calling on it to exercise a new function it confers on it, so to speak, a richer organisation. Instead of shutting up activity in a closed circle it opens to it an illimitable field.

Before I continue this comparison there is a preliminary question which requires examination, and that is the question of the meaning in this connection of consciousness and

unconsciousness. When we speak of instinct and intelligence as knowledge, in what sense do we use the word knowledge, and what is its relation to consciousness? How, it may be asked, can instinct be described as knowledge when, for the most part, instinctive actions seem to be quite unconsciously performed? Are they not mere continuations of vital processes analogous to the vital processes of plant life? When we speak of the instincts of plants, we do not imagine that they possess anything that can be described as consciousness, in the sense that they involve either feeling or knowledge. The reflex movements of our organs and the vital movements of the cells that combine and organise to form our body with its functions, afford no evidence of consciousness either in themselves or in us. Some creatures, acting instinctively, may possibly be conscious of their actions, but it is practically certain that the great majority of instinctive actions are quite unconsciously performed. Are they then unconscious in that absolute sense which would make the description of them as knowledge, meaningless? Is the difference between instinct and intelligence merely the difference between conscious and unconscious action? Bergson's argument on this question is interesting and, I think, entirely original. There are two kinds of unconsciousness, the distinction between them is ordinarily little noticed, but is one of great importance. There is the unconsciousness which denotes the entire absence of consciousness, the fact that it does not exist. This is the unconsciousness we attribute to the material world,—a falling stone, for example, has no consciousness of its fall. The other unconsciousness is consciousness annulled. The unconsciousness which is the negation of consciousness and the unconsciousness which is consciousness annulled, mathematically expressed are both equal to zero, but while the first expresses that there is nothing, the second expresses that two equal quantities are compensating and neutralising one another. These two quantities are representation and action. Consciousness consists in their inequality, unconsciousness in their equality.

When we mechanically accomplish an habitual action we act unconsciously. When a somnambulist acts his dream unconsciousness may be absolute. In these cases representation is blocked out by or merged into the action. And the proof is that if the action is stopped or if an obstacle is interposed, consciousness arises. The consciousness is not a new fact, it was always there, the interruption has not created it. It is precisely the inadequacy of the action to the representation. It signifies hesitation or choice. Where many possible actions are sketched without being carried out into any real action as when we simply deliberate, consciousness is intense. Where the real action is the only possible action consciousness is annulled. From this point of view Bergson defines the consciousness of a living being as "an arithmetical difference between virtual and real activity. It measures the distance between representation and action."

Consciousness and unconsciousness as regards instinct and intelligence are therefore a difference only of degree, they are not the main nor the essential difference between them. Consciousness may be considered as accidental in the case of instinct, normal in the case of intelligence. In the case of instinct, instrument, application and end desired are all part of the organised nature of the creature, and a very feeble part is left open to its choice. Where consciousness may be supposed to occur, it is less for the sake of the instinct itself than for the obstacles or contrarieties to which it may be subject. The distance between idea and action which in this view could alone become consciousness is a deficit in the case of instinct. On the other hand this deficit is the normal condition of intellect. The original function of intellect is to manufacture unorganised instruments, it must, therefore, in face of countless difficulties choose for the work, time and place, form and matter. Knowledge, therefore, is rather acted and unconscious in the case of instinct, thought and conscious in the case of intelligence. Consciousness is the light more or less intense which plays

round and illuminates the two forms of internal activity but does not constitute the essential difference between them.

What, then, is this essential difference? The difference between instinct and intelligence from the point of view of knowledge, regarded, that is to say, as the innate or natural knowledge of living creatures, is that instinct is a knowledge of things, intelligence a knowledge of relations. Instinct is an innate knowledge of matter, intelligence an innate knowledge of form. The term innate has no reference to the old controversy concerning innate idea, it merely attempts to express what we may describe as the nature of knowledge, the faculty of a living creature independently of any particular experience. This faculty in the case of instinct is a knowledge of a determinate material thing, in the case of intelligence it is knowledge of the general relations of things. When, for example, the new-born infant seeks for the first time the mother's breast, it shows a knowledge, unconscious in the narrow sense, of an object of which it has had no previous experience, and precisely because that knowledge is the innate knowledge of a determinate object, we call it instinct and not intelligence. The intelligence of an infant is not manifested in its knowledge of a determinate object or a determinate property of an object, it consists in the natural ability to understand the relation of an attribute to a subject. The first time that we are able to apply before it an adjective to a substantive it will show a natural ability to understand. Intelligence is the faculty of using categories. Considered, therefore, from the point of view of knowledge as distinct from that of action, and applying a logical description to the two forms of knowledge, we may describe instinct as essentially categorical, intelligence as essentially hypothetical. This enables us to compare the two forms in regard to their advantages and their disadvantages to their possessors. Instinctive knowledge would clearly be preferable if it could be applied to an indefinite number of objects, but we find, in fact, that it is always confined to

one special object, often, indeed, to a mere part of an object. But it is a knowledge that is full and complete, not necessarily explicit, but, so far as it is implied in the accomplished action, it is perfectly adequate. Intelligence, on the contrary, is a knowledge that is an external and empty form, but at the same time a form in which an infinity of objects can take their place turn by turn. It seems as though the force which has evolved through living forms had before it a choice of limitations in the realm of knowledge, the one a limitation of extension, the other a limitation of comprehension. It is these limitations that give rise to the philosophical problem. Intelligence seems to lack that which only instinct can supply, and instinct while possessing that for which intelligence is ever striving, has no power of seeking that which lies beyond its immediate possession. It does not and cannot rise to the degree of self-consciousness that intellect possesses. The purely formal character of the intellect carries with it the disadvantage that it is for ever seeking, and can never attain the matter which is the interest and end of its speculation. Instinct, on the other hand, possesses that desired materiality, but itself seeks for nothing beyond, it does not speculate. "There are things that intelligence alone is capable of seeking, but that by itself it will never find. Those things instinct alone could find, but it will never seek them."

This comparison of intelligence and instinct as natural functions is possible when we put ourselves at the point of view of ordinary common sense, which is also the point of view of physical science and psychology. It is not the point of view of philosophy, and it is not necessary therefore to raise the ultimate metaphysical question. The distinction between the two points of view is of fundamental importance. If from the philosophical standpoint we regard the intellect as a faculty whose function is pure speculation, we must accept its categories as absolute, irreducible and inexplicable. If the intellect is absolute, knowledge is relative. If the form of the

understanding is ultimate, it is vain to inquire why it is what it is, and not other than it is. If, for example, we say that the understanding is the function of unification, knowledge must then be relative to the requirement of unification. Knowledge is not advanced, but circumscribed, for we can show no reason why the function of the understanding should not be multiplication. All we can say is, that were it so, knowledge would be of a different kind. If, on the other hand, taking the standpoint of ordinary common sense, we regard the intellect as the function or endowment of a living creature and as relative to the necessities of the activity of the living creature, we can then deduce its form from its function, or discover in its function the explanation of its form. And just because from this standpoint the intellect is neither independent nor absolute nor ultimate, knowledge, while dependent upon it is yet not a product of it, but an integral part of reality. But is not this simply begging the question? What else is it but an attempt to explain intelligence by the action which presupposes it? It would be so if it were offered as an answer to the metaphysical question, the question of the ultimate nature of knowledge, of truth, and of reality. The present question takes the point of view of common sense, and asks to what part of the material world is our intelligence specially adapted? Intelligence and instinct then become objects of thought, part of the reality which we distinguish from knowledge, and the reply to our question is that so considered or so observed, intelligence is particularly directed to the inorganic solid world, instinct to the organic vital world. If this be a true description of fact, it forms the basis of a theory of knowledge. The powers that we observe in conscious creatures, ourselves or others, and name intelligence and instinct, are identical with the two powers which from the philosophical standpoint of the subjective analysis of knowledge, we name understanding and intuition. To the one belongs our knowledge of the material world, the world of physical reality in which our activity is

spent, and to which it is adapted, and to the other is due the knowledge we have of life itself.

Let us now follow out this comparison in more detail "Our intelligence such as it comes from the hands of nature has for principal object the unorganised solid." It is only in a world of solid objects that we can exercise our practical activities, and intellect is only completely at home in such a world. Solid matter is apprehended by the sense of touch. There is a natural tendency to explain all the senses by touch. Thus, vision which appears to give us knowledge of objects with which we are not in touch is scientifically explained as the impinging of vibrations on the retina. We apprehend the physical world as an extended world of objects external to one another. The positive characteristic of this world is its discontinuity. Objects form unities. Every object may be thought of as divisible into parts, but primarily we think of it as an unity. Continuity is only a mode of the discontinuous, it is a negative representation and simply expresses the refusal of the mind to regard any form of discontinuity as the only possible one. It is the discontinuous alone that the intellect can represent clearly to itself. To this natural disposition is due the difficulty we have in representing movement and change. In apprehending movement, for example, the intellect is only concerned to know where the mobile object goes, where at any particular moment it is. Its present or future position, not its progress, the motionless plan of its execution, not the actual movement itself, are all important. We have also a natural disposition to regard matter as more ultimate than form. The power to make things is the power to give form to matter, and we seem to possess an unlimited power of decomposing and recomposing matter. These natural dispositions or characteristics of intelligence also illustrate themselves in social life. We communicate by mobile signs. Language consists of words which are not adherent to the thing signified. Probably insects communicate by adherent signs. The mobility of the

signs that intelligence uses has enabled words to be extended from things to ideas and has made reflection possible. The faculty of reflecting, of creating ideas, has set the intelligence free from practical action and has enabled it to concern itself with pure theory. But the practical character of intelligence is seen even in pure theory in the forms which it gives to ideas. Distinctness and clearness are terms borrowed from the material world, to apply them to ideas is to conceive ideas as external to one another like objects in space. Ideas constitute an intelligible world resembling in its essential characters the solid material world, but with lighter and more transparent elements. Ideas are not the perceptions of things but representations of the act by which the intellect is fixed on them. They are symbols not images. Logic is the collection of rules to be followed in the manipulation of these symbols. It is most successful in geometry because geometry has for its subject matter the solidity of bodies. On the other hand the intelligence completely fails to represent the real continuity which is life. Physical science is marked by a natural inability to comprehend life. The progress of physical science is the discovery of an ever increasing number of elements. Its ideal is to reconstitute every object and every event out of data already possessed. It separates things in space and events in time. Determined antecedents produce a determined consequent calculable in terms of them. The ideal of science admits no novelty, no real becoming, no continuity. Life which is essentially continuous change or becoming, which implies at the same time multiplicity of elements and their reciprocal interpenetration, is to physical science incomprehensible.

Instinct as a natural function appears to be the direct opposite of this. It is itself a continuity of the life process. It is difficult in many instances to mark the limit where organisation ends and instinct begins. The most essential primary instincts are vital processes. The cells that compose our body live each its own individual life, each drawing individual

nourishment, each completely individual in its activity at the same time that it is subserving the organism of which it forms a part. The free moving cells in our body are as independent in their activity as the infusoria. Yet in all this we see only vital process, not instinct. In like manner the individual bees that compose the swarm appear to us each to be independent, yet we know that they must be organically combined by relations that are imperceptible to us, for we find that the individuals cannot live in isolation. A complete analysis of instinct seems to be beyond science, because scientific explanation consists in the translation of perceptions into terms of touch, and it is impossible to express the essential characteristic of instinct in such terms. The characteristic mark of instinct, as compared with intelligence, is best expressed by the term sympathy. This expresses its essentially internal direction as distinguished from the external view of reality which is characteristic of intelligence. Instinct seems turned towards life. It corresponds to the power which in ourselves we name intuition. Intuition seems to be instinct that has become disinterested, self-conscious, capable of reflecting on its object and enlarging it indefinitely.

What evidence have we that there exists this function that we name intuition and describe as sympathy? In what respect does it differ and in what way are we conscious of its difference from the power we name intelligence? How is it manifested in experience? Its simplest manifestation is in the experience of an æsthetic faculty existing side by side with the faculty of normal perception. "Our eye perceives the characters of a living being, but sees them juxtaposed, not in organic relation to one another. The purpose of life, the simple movement which runs through the lines, which binds them to one another and gives them their meaning, escapes it. It is this purpose that the artist seems to possess himself of by placing himself within his object by a kind of sympathy, by an effort of intuition which enables him to break down the barrier that

space interposes between him and the model. It is true that this æsthetic intuition is always individual but it is possible to conceive it directed towards life in general, and like physical science, ranging individual facts under general laws."

This in bare outline is Bergson's view of the nature of instinct and intelligence and in the last sentence we have an indication of his conception of the *rôle* of philosophy. We have to take count of two faculties, intelligence and intuition. Only with difficulty are they comparable to one another, for each deals with a different sphere of reality but each completes the other. Philosophy in showing the relation of theory of knowledge to theory of life, describes reality from the higher standpoint of life itself.

To appreciate the significance of this theory, the exact meaning we attach to the terms must first be made clear. Instinct is a word with a very wide and loose connotation. There is no ambiguity in Bergson's use of it; it is the name given to a power that may be abundantly observed in living creatures and accurately described, and any doubt as to its application is cleared away by the illustrations of it which are drawn chiefly from the phenomena of invertebrate life. The point, however, for us in this discussion is not the scientific value of the observations, but the exact philosophical significance and value of the facts observed. The philosophical theory is that some knowledge is possessed by us, or obtainable by us, without the exercise of our intellect, using intellect in the strict meaning that we have previously indicated, but by a power which we may name intuition due to a faculty identical in every respect with instinct as we may observe it in other creatures. In other words, there are two kinds of knowledge, corresponding to these two different faculties, instinct and intelligence. These two kinds of knowledge are completely opposite in their nature, and serve the purpose of life in different ways. And they appear to have evolved as alternatives, and in a sense at the expense of each other, for where, as in the

Hymenoptera, instinct seems to have come to perfection, intellect appears to be very slight, where, as in man, intellect has come to perfection, instinct is but a surrounding fringe.

It is clear that a theory of this kind is not to be established by rigorous logical proof or mathematical demonstration. The classical philosophical systems have all been the work of men who were in the first place logicians and mathematicians. In basing his argument on biological facts, Bergson in a sense invites us to find the *rôle* of philosophy in a method which claims to rise above the logical and mathematical standpoint. Not that logic and mathematics are opposed to this biological point of view, far less that they are falsified by it, but that they are superseded. Life is something that they fail to comprehend. Life may account for them, but they cannot account for life. Is such a standpoint possible? If it be, there is for philosophy the possibility of a progressive achievement in metaphysical theory comparable to that which modern science has attained in physical theory. That this is the confident hope and the ideal of Bergson is manifest in all his work. In bringing, therefore, logical tests to these theories, we must keep in mind that what they are mainly concerned to do is to deliver us from logical contradiction by revealing to us a reality which, though not refusing logical form, yet overflows it. Our knowledge of reality, this theory asserts, is not confined to the categories of the understanding. These categories form for us, encase, as it were, so much of reality, and reality in such form alone as is necessary for our practical activity. The understanding limits our knowledge just as the eye limits our vision. Were the eye to admit the whole of visible reality it would be useless. The eye is useful because it confines our vision to that small portion of visible reality that serves our practical needs. In like manner the intellect limits our knowledge at the same time that it is the faculty of knowledge.

It will be seen, then, that Bergson employs the word

instinct in a special sense and to denote quite definite phenomena. How does his meaning accord with the general use of the word by psychologists? I have found it very difficult to discover what it is exactly that psychologists mean to indicate by instinct. In the chapter on instinct in James' *Text-Book of Psychology*, for example, the word is used for very vague and indefinite states that admit no sharp definition and seem impossible to classify. The more positive and definite character that instinct assumes for Bergson is due, I think, to the fact that he has taken as illustrations and as types of instinctive action the phenomena of insect life, illustrations based on observation of creatures that differ widely from ourselves in bodily structure and organisation. And we shall probably therefore be inclined to challenge the view that light can be thrown on the problem of human knowledge by arguments based on such observations. Most psychologists will, I imagine, claim that they belong entirely to natural history. The instincts of insects and other creatures, it will be urged, are known by external observation only, and in the same way that we observe the life movements of plants and the chemical combinations of the inorganic world, and when we compare the actions of these creatures with our own intelligent actions, we speak of them by a natural metaphor as manifestations of knowledge. But can we observe in ourselves by introspection any mental processes that are identical with these instincts of the lower creatures? Is there anything in our own consciousness that corresponds to or resembles the migratory instincts of some birds or the constructive instincts of some insects? Are what we call our own instincts, cognitions? The main distinction between Bergson's view and that of current psychology seems to me to be that he holds instinct to be cognition. In psychology, and certainly in ordinary thought, instinct is opposed to, rather than classed under, knowledge. When we speak of our own instincts we generally mean

dispositions or habits, and we account for them either as originally intelligent action become by custom automatic, or as survivals in our organism of inherited dispositions. If we take, for example, Mr. Macdougall's *Introduction to Social Psychology*, in which an important theory of the instincts is developed, we find that the instincts described and enumerated by him are actions or feelings such as flight, repulsion, curiosity, pugnacity, and such like, and they are attached to emotions, not to cognitions, they bear no sort of resemblance or relation to anything that can be described as intuition. They are recognised rather by their opposition to knowledge than by any special relation to it.

There are, then, I think, two difficulties in the way of the recognition of instinct as knowledge. The first concerns its existence and the second its content, supposing that we believe it exists. When I observe the actions of an insect elaborately and accurately providing for the needs of an offspring that memory cannot have led it to expect and whose wants cannot possibly have been learnt from experience, it seems to me, indeed, as though the creature must be guided in its activities by knowledge, but in so expressing it I am consciously anthropomorphic. What but confusion can arise from attributing these actions to knowledge, and comparing such knowledge even as a contrast with the knowledge that an intelligence acquires by reflection on experience? The salivary glands that pour out their secretion when we introduce food into our mouths act as though they knew that digestion required the conversion of starch into grape sugar, but we do not describe them as possessing this knowledge. Instinct, like intelligence, seems to depend as a function on a centralised nervous system, and this fact connects the actions dependent on them into a special class distinguished from general vital actions, but a nervous system serves wider purposes than the acquirement of knowledge. We may institute a comparison, therefore, between actions accordingly as they are intelligently or instinctively performed, but

we can discover nothing in instinctive action that can be described as knowledge in the psychological sense of cognition.

This, I imagine, is one form that the objection to Bergson's view that instinct is knowledge, differing from the intelligence by being an intuition of reality, would take. A still more serious difficulty presents itself with regard to the content of this intuitive knowledge. It is conceivable, we may allow, that there may be such direct vision of reality; but if there be, it is difficult to see that it can be of any use to us from the point of view of theory. It can receive no interpretation nor meaning; it can never, so to speak, render up its secret. Imagination, representation, memory, form no part of it. If we know life by intuition, from that knowledge is excluded our remembrance of yesterday, or of an hour, or a moment ago; it can be known purely and only as actually present.

I have stated these objections as strongly as I can because they have constituted for me the main difficulty in accepting the theory. And these objections seem to me insuperable if we accept the analysis of knowledge which underlies the ordinary theories of idealism and realism. This theory rests on a new analysis. It demands a new psychology. It is irreconcilable with any theory of knowledge that interposes between the object known and the knower an entity that is primarily and essentially psychical and declares that immediate knowledge is of that mental entity. It is inconsistent with the view that sensations, perceptions, and thoughts are mental states which form the matter of consciousness and from which we infer, or it may be deny that it is possible to infer, the separate non-mental existence of physical matter. I must confess that until recently I have regarded such a result of the analysis of consciousness as a self-evident fact that could hardly be thought to admit of dispute, and that all attempts to escape the idealist or, rather, the solipsist conclusion involved in it were either transparent assumptions or else an attempt to ignore the plainest implication and proceed as though it did

not exist. The only philosophical alternatives have appeared to me to be dogmatism or scepticism. I have come to think, however, that the view Mr. Alexander has expounded to us in his two presidential addresses offers a way of escape. This view is that in a simple description of perception we find nothing in the nature of a presentation or state of consciousness which we can distinguish as a mental entity from a non-mental thing, and of which alone we are primarily and immediately conscious. The true description of perception is that a non-mental physical object is revealed to a being organised to receive the revelation, and that revelation is reality itself to such extent and in such form as the organisation is fitted to receive it. This is my own interpretation of Mr. Alexander's view, and not a quotation, and I am not proposing to follow the theory into the debateable questions of the nature of sensations and images. All that I wish to say is that it appears to be a view entirely consistent with Bergson's theory of knowledge, and one that has removed for me the main difficulty that I have found in accepting that theory. "The objectivity of a material thing is immanent in our perception of it, provided we take the perception in its primitive state (*à l'état brut*) and in its immediate form. Immediate intuition seizes the essence of life as well as that of matter. To say that knowledge comes from the subject, and that it prevents the immediate datum from being objective, is to deny *a priori* the possibility of two very different kinds of knowledge: the one statical, by concepts, in which there is in fact a separation between that which knows and that which is known; the other dynamical, by immediate intuition, in which the act of knowledge coincides with the act that generates reality."*

The difference, then, between intuition and intelligence is not only or mainly a difference between knowledge which is

* Quoted from a reply by M. Bergson to a criticism of M. A. Fouillée, *Bulletin de la Société française de Philosophie*, 1908, p. 341.

immediate and knowledge which is mediate, but a difference between the statical or the dynamical form that knowledge assumes. Intuition is the original type of all knowledge and intelligence is a contracting or shrinking as it were of this wider knowledge in order to concentrate it, and in so doing make it serve the practical needs of living creatures. Accordingly, the solution that Bergson offers us of the problem of knowledge differs radically from the classical theories, old and new. Hitherto there has seemed to be a choice between three alternatives, each of which has presented its own difficulties and contradictions. Either it has been held that things determine the mind, or that the mind determines things, or that between mind and things there is a mysterious agreement or pre-established harmony. Once allow, however, that mind overflows the intellect, that the intellect is a nucleus surrounded by a fringe of intuition, that the reality revealed by this intuition is not a material thing fixed in an absolute space, but life the existence of which is an absolute duration, and a fourth alternative is disclosed. This is the theory that intelligence is a special function of mind essentially turned towards inert matter, and that intelligence and matter have been progressively adapted the one to the other, to reach at last a common form. This adaptation has been brought about quite naturally, because an *inversion* of the same movement has created at once the intellectuality of the mind and the materiality of things. The theory of knowledge shows the genesis of matter at the same time and as counterpart of the same evolution which has given us intelligence. Our bodies and the other images that compose the material world of physical science and that present themselves to our mind as a solid world extended in space, and the intelligence which apprehends reality in that way, are together the creation of the evolution of the original impetus of life.

VI.—SCIENCE AND LOGIC.

By E. C. CHILDS.

THERE is one view which is generally accepted with regard to the logical aspect of thought which seems to act as a hindrance to the study of Logic. This view is, that although the form and matter of thought are inseparable in fact, yet we, in distinguishing them, may legitimately ascribe a certain amount of independence to them. It is further argued that although we cannot from the beginning of knowledge tell what the middle and the end of the matter will be, yet we can see accurately enough what the form will be. Mr. Joseph, in his book on Logic, says, for example, that the apprehension of the forms of thought has not to wait upon the completion of knowledge. Similarly Dr. Bosanquet looks upon Logic as an account of the intellectual structure of reality. Now, in general, no exception can be taken to this principle, and it is one which is admitted in all branches of knowledge. There is no need for a single science to wait till another has completed its task before it pursues its own course. But with the liberty of going forward without regarding the stage which other sciences have reached, is imposed the necessity of revising or confirming what has previously been established. More especially is this necessary in the case of a study which, like Logic, is more or less parasitic. It lives upon the general body of human knowledge; and therefore at each stage in the development of knowledge the doctrine of Logic must receive a corresponding modification. It is not likely that these modifications will affect the most fundamental laws of thought: but the modifications, as I shall try to show, are at any rate sufficiently important to ensure that Logic has, at any rate, the opportunity of developing side by side with the natural sciences.

The relative importance ascribed to the syllogism and to induction has varied greatly from the time of Aristotle to the present day, and although it may be quite easy to show that Aristotle did not neglect the inductive processes, it is also easy to see that the existence of natural sciences using inductive processes to reach laws of great generality must exert a pressure upon the modern logician which was not felt by the ancient philosopher.

The doctrine of Induction seems to me to illustrate the necessity of keeping a continual check upon logical doctrine by reference to the actual processes of scientific thinkers. Since the time of Mill this particular portion of logical doctrine has been the subject of interesting and lively debates. But it is at any rate worth considering whether, as scientific thought increases in rigour and exactness, the account Logic gives of these processes of thought should not be made more definite as well.

I propose, therefore, in the first place to consider Mathematical Induction, and my account is based mainly upon the work of Poincaré on this subject; then I want to show that the same method is applicable, though in an approximate form, to physical science, and that, therefore, it may be taken as the real type of Induction.

This is a complete reversal of Mill's method; for he considered that the inductions in Mathematics were so few in number, and so obvious and elementary, that they seemed to stand in no need of the evidence of experience (Ch. 1, Bk. III, *Logic*).

Leaving on one side Mill's view of the relation of Mathematics to experience, another point must be noted here. The processes of generalising a given particular proposition is one of the most frequent and not always the most easy task set to the mathematician.

At the outset of the enquiry a familiar difficulty arises in respect of inductive process. Either the conclusion contains exactly what was in the premises and no more, and so the

general proposition is but an economical summing up of our knowledge, or, on the other hand, it does include more than the premises, in which case the question arises as to the validity of the extension. In the first case, we should never arrive at a general law ; and in the second, having the general law, we require to know whether the generalising process is justifiable.

Now it cannot be held to be a part of the business of Logic to decide in its own right by what methods we arrive at true conclusions ; all it can do is to accept the methods which are considered good in the case of each science. Therefore, in order to give a good account of Induction, it will be best to consider the process in the science in which the results are most clearly justified, and in which the method is shown with clearness and rigour. This seems to be the case in Mathematics ; but there is one other point which requires notice before proceeding to the main question.

Since the end of an inductive process is some universal proposition, and the beginning is some particular one, the problem of Logic in this case is to find the valid argument which connects the two. Now there is one easy way out of the difficulty of moving in thought from the particular to the general proposition, and that is to efface the distinction between the two ; to say that the particular implies the general and that the universal implies the particular. This may be allowable when the task of discovering the general proposition is over, and we are able to look back upon the whole system of thought. Then we certainly shall find that universal and particular are bound into the closest unity. But this does not seem to be the properly logical standpoint, although it may be a good one in itself. Logic should show the road traversed in passing from the originally given particular to the general law which is sought. On the borderland of knowledge, particulars are frequent which are not yet harmonised into system by a general law ; and there are some which never will be. At this stage, the more metaphysical account is too general and abstract to be useful, and in

all cases Logic seems to require a plain description of the process of generalisation.

The form to which I think all inductive reasoning approximates is that of Mathematical Induction, the very method which Mill refused to call Induction at all. It is one of the fundamental methods in Mathematics; but in order to keep clear of complications arising from postulates I will quote it in the words of Poincaré as applied in arithmetic. He says: "The essential character of reasoning by recurrence is that it contains, so to speak, in a single formula an infinite number of syllogisms. In order that we may better take account of this, I will enumerate, one after the other, the syllogisms which are, if I may be allowed the expression, arranged in a cascade.

They are, it should be understood, hypothetical syllogisms.

The theorem is true of 1. But if it is true of 1 it is true of 2. But if it is true of 2 it is true of 3. Therefore, it is true of 3, and so forth.

It may be seen that the conclusion of each syllogism serves as the minor premise of the following one.

Moreover, the majors of all the syllogisms can be united into a single formula: If the theorem is true of $n-1$ it is true of n ." (*La Science et l'Hypothèse*, p. 30.)

This formula is the principle upon which the argument depends. The theorem in question is established in the case where $n = 1$; it is then shown that if it is true for $n-1$ it is true for n , and thus it is concluded that it is true for all numbers.

This conclusion is not the mere summation of known cases, nor can it be verified analytically for the reasons which follow. This conclusion can be verified in the case of any finite number; but no matter how far we carry the series of verifications for finite numbers, and no matter how great a number we choose, there will always be a greater, we shall never reach the infinite series necessary to verify the general theorem. To verify the general proposition rigorously we should be obliged to carry out the verification until we reached a number greater

than any assignable number, that is to say, till we reached infinity, and this is impossible. The magic power with which the word "all" invests a theorem cannot be derived from the consideration of any number of steps, however large, in such an argument. For practical purposes, no doubt, a limited series is quite sufficient. There is usually no pressing practical need to prove a general proposition so long as we can show that it is true in a very large number of cases. For such a large number of cases we can always verify the particular conclusion. But the limited validity thus given to a conclusion is by no means satisfactory; it is the universal proposition which is the goal. We want to reach a proposition which is true in all cases; although the extension makes verification impossible because of the illimitable elasticity of the numerical series. We shall find that the same is true of general propositions in chemistry and physics.

The essential principle in Mathematical Induction now requires some further consideration, for it is, as I think, the principle which underlies all induction. The principle may be stated as follows: If a theorem is true of the number 1 and if it is shown that it is true of $n+1$, provided it is true of n , it will be true of all whole numbers.

This principle, if valid, is the justification of the leap from the finite to the infinite which is made in the generalisation of mathematical theorems. It must be noted here that "infinite" is used, not as if it were a real number, but meaning greater or less than any assignable quantity.

There are five possible ways in which we may give an account of this principle:—

- (1) It may be derived from experience;
- (2) It may be derived immediately from the principle of contradiction;
- (3) It may be a definition of a whole number;
- (4) It may be a convention;
- (5) It may be a synthetic judgment *a priori*.

It is the last view which seems to me the correct one, and, therefore, I will consider in order the objections which can be brought against each of the other views :—

(1) Such a principle cannot be derived from experience, for we can never come to the end of an infinite series, and therefore we are never justified in concluding a universal proposition upon the evidence of experience alone.

(2) The principle of contradiction would carry us no further towards a universal proposition than does an appeal to experience. For the principle of contradiction would enable us to develop the series of numbers as far as we pleased, but, again, we could not reach the point which enables us to include an infinite series in a single formula. The principle of contradiction would perhaps suffice for all practical purposes, but it fails to satisfy the theoretical demand for a universal proposition.

(3) The principle of complete induction may be a definition in disguise; or by making a limited number of definitions or assumptions the principle may be derived from them.

This is the most thorny ground upon which I have touched, because so many ingenious and elaborate attempts have been made to get rid of the principle of complete induction as a synthetic judgment, and it is almost impossible to do justice to them. I will, therefore, indicate what seem the most typical modes of dealing with this question, and point the objections which can be raised.

(a) The following five axioms may be considered as disguised definitions; and as they include the principle of complete Induction, if it can be demonstrated that they are definitions, then the view that a synthetic judgment is involved in Induction cannot be maintained. The five axioms were thus enunciated by M. Peano :—

- (1) Zero is a whole number.
- (2) Zero does not follow any whole number.

- (3) The number immediately following a whole number is a whole number; and every whole number has a whole number which immediately follows it.
- (4) Two whole numbers are equal if the numbers which immediately follow them are equal.
- (5) The principle of complete Induction, viz., if a theorem is true of the number 1, and if it is proved to be true of $n+1$, provided it is true of n , then it is true of all whole numbers.

Now the test which must be applied to all definitions in Mathematics is that they do not lead to contradictions. Therefore, if these five propositions are really satisfactory definitions, it must be demonstrable that they do not lead to contradictory conclusions. In the first place let us attempt to do this by means of examples. Take the series 0, 1, 2. This satisfies four of the definitions, but in order to satisfy the third definition 3 must be a whole number, and so the series becomes 0, 1, 2, 3. Therefore this series must satisfy the five given definitions. Verification is possible in the case of four, but in order to satisfy the third definition 4 must be a whole number, and the series becomes 0, 1, 2, 3, 4. It is clear, then, that we cannot demonstrate the absence of contradiction in the case of a few numbers without demonstrating it in the case of all; and to demonstrate it in the case of all will require the use of the principle of complete induction which we set out to justify.

There is another way in which it may be attempted to demonstrate the absence of contradiction in these definitions. Let us consider the whole consequences of accepting these definitions. But the consequences are the whole of arithmetic, and consist of an infinite number of propositions. How, then, can it be demonstrated that no contradiction arises? Apparently only by continuing the series of numbers in accordance with the third definition; and in doing that we are again falling back upon the principle of complete induction: which we set out to justify.

(b) Secondly, we may define whole numbers as those upon which it is possible to reason by recurrence; thus it may be possible to avoid the conclusion that the principle in question is a synthetic judgment. Let us consider in this case a series of syllogisms which may be based upon a given number of axioms as premises. When the n^{th} syllogism is reached, it is clear that we may add one more, the $n+1^{\text{th}}$, so that the number n serves to count a number of successive operations. It is a number, moreover, which may be obtained by successive additions. Similarly, unity might be reached by successive subtractions. If $n = n-1$ this would not be possible, for we should always reach the same whole number. Therefore the fashion in which we have been considering the number n involves a definition of finite whole number, and that definition is the following:—

“A finite whole number is such that it can be obtained by successive additions, so that n is not equal to $n-1$.”

We can demonstrate, therefore, that if no contradiction arose at the n^{th} syllogism, there would be none at the $(n+1)^{\text{th}}$. It may be urged, then, that it is allowable to conclude this, because finite whole numbers are those for which such reasoning is legitimate. But this implies a second definition of whole number, which is the following: “A whole number is one upon which it is possible to reason by recurrence.”

These two definitions cannot be derived from each other, so that although they are equivalent they are not identical. Moreover, the judgment that they are identical involves a synthetic judgment *a priori*.

(4) Fourthly, it is impossible to look upon the principle of reasoning by recurrence as a convention, just as certain geometrical propositions are conventional. As an example, we may take Euclid's postulate: “Through one point only one straight line can be drawn parallel to a given straight line.” This proposition may be denied without making geometry impossible; but it is impossible to deny the principle of

reasoning by recurrence and establish a new system of arithmetic analogous to the non-Euclidean geometries.

(5) The principle that if a theorem is true of the number 1, and if it is proved true of $n + 1$, provided it is true of n , then it is true of all whole numbers, is thus a true synthetic judgment. It arises from the power of the thinker to conceive the indefinite repetition of an act, and its validity is bound up with its origin. We cannot attack the validity of such principles when once established, without attacking the validity of all thinking, though, of course, we might do both. It is curious to notice, in passing, the connection between this principle and the definition given by Professor James of the act of forming concepts. Conception, he says, is the power of meaning the same in a number of numerically distinct cases. This definition is very closely connected, if, indeed, it is not based upon the general principle of reasoning by recurrence. One other point will conclude this part of the discussion.

Mathematical Induction needs no such postulate as the uniformity of Nature. This is only needed when we come to physical inductions. So far, all that is involved is the uniformity of thought. My conclusion is that perfect induction involves a synthetic judgment *a priori*.

The next point is to consider the connection between mathematical and physical induction. The obvious difference is the one noted above, that the mathematical conclusions derived from reasoning by recurrence are self contained, whereas physical induction involves a certain belief as to the structure of the physical universe, and that pure reasoning by recurrence in this case must further be supplemented by the application of the laws of chance. But I think it will be possible to show that in most respects Induction in mathematics and physics exemplify the same logical process.

The first important reason for the connection is that our notion of a mathematical continuum arose under the stimulus of our physical environment, and therefore it is not surprising

that after the refinements of mathematical rigour the results are found directly applicable to the physical world. The business of the science of measurement is to reduce to order the contrary and sometimes contradictory experiences which we have of the external world. A well-known psychological experiment provides an example. A sensation of pressure is not increased if the weight producing it be increased by only a small amount.

Thus, while a weight A may be indistinguishable from a weight B, and at the same time B may be indistinguishable from C, yet the weights A and C may differ sufficiently to be distinguished.

Therefore, from crude experience we should conclude that—

$$A = B, \quad B = C, \quad \text{but yet } A > B.$$

This conclusion is unacceptable both from its disagreement with the law of contradiction, and its inapplicability to the manipulation of objects. That this difficulty, moreover, is of frequent occurrence can be seen if we consider the list of important physical instruments designed to overcome it. The microscope and the reflecting mirror for detecting small oscillations are two obvious examples. Theoretically, this difficulty was overcome by the creation of the mathematical continuum. This was accomplished by introducing small quantities inappreciable to the senses between A and B and between B and C. To this introduction of new terms to the series there is no limit, and by the invention of more delicate instruments the senses are only able to maintain a lumbering pace when compared with the rapid flight of the mathematical imagination. So was begun the substitution of a mathematical continuum for the inconvenient physical continuum given by crude experience. This substitution is the first stage in the study of physics, but it must be noted, however, that the substitution does not remove the difficulties of sense perception, but it gives a method of bringing them to agreement for practical and

theoretical purposes. The original contradiction still remains, but we only come sharply against it when we reach the limit of the delicacy of our physical apparatus or when some unaccustomed example accentuates it. This particular difficulty must have caused grave speculation on the part of primeval man, but we have become in common matters habituated to the solution so much that we are apt to think that the physical universe adapts itself to the application of mathematical formulæ. Whereas in fact it is only by means of elaborate apparatus and difficult manipulation that mathematical notions can be shown to correspond to physical facts. As soon, however, as this correspondence can be shown even approximately, the inductive processes which are valid in mathematics are equally valid in physics; so that the pure type of Induction in physics is again perfect Induction or reasoning by recurrence. To the infinite extensibility of the numerical system corresponds a world of matter indefinitely divisible into equal parts. But the indefinite divisibility of matter is an ideal, just as is the indefinite extensibility of the numerical system. The limit is placed in the case of physics mainly by our skill in manipulation, and in mathematical series by the needs of the moment. In either case we can go further when we want to. In either science, having established a theorem in a particular case, we at once generalise by the aid of the principle of complete induction. But when mathematical generalisations are applied to the natural world another principle is introduced. We are bound to assume a uniform order in Nature. This principle is not involved in mathematical reasoning, because although mathematics arose as a result of measuring the objects of the physical world, mathematical notions are suggested rather than based upon physical objects, and are framed without explicit reference to them. Therefore, it will be better to distinguish the assumptions contained in physical inductions from any contained in mathematics. It might be, however, that the two principles are really one, for the reason that, if the physical universe were

chaotic, we should probably try to account for it by some system of uniformities.

In chemistry the same tendency to make mathematical laws applicable is shown, although the difficulties are much greater than in physics. The notion, in various forms, of elements is as old as philosophy. In more recent forms the advantages of dividing substances into atoms, and so approximating again to mathematical series or groups, are so great that the atomic hypothesis has been maintained in spite of serious disadvantages. The advantages are well known, but, as Professor Ostwald says, we have become accustomed to the defects and they cease to worry us. I will mention one defect, which was recognised at the outset. If atoms remain unaltered in their combinations it might naturally be expected that the properties of the compounds would be the sum or the average value of the properties of the elements. The chemist Boyle drew this conclusion from the hypothesis, and was greatly surprised when he found that it was not confirmed by experiment. On the contrary, for example, the striking properties of acids and bases disappear when they unite to form a salt.

No attempt was made to overcome the difficulty by falling back upon a purely qualitative theory and thus giving up the notion of mathematical groups and series. On the contrary, all attempts so far made have maintained the mathematical conception, and, for example, it has been proposed to consider that the properties of substances depend in some fashion upon the oscillations or other movements of atoms, and that by the combination of several atoms among themselves the character of these movements is changed. The tendency, therefore, is always towards a mathematical interpretation, towards the hypothesis of a system of material points to which mathematical laws are directly applicable, and, therefore, it is clear that generalisation must involve the principle of complete induction.

I will quote just one passage from Professor Ostwald, which

shows that this principle is openly acknowledged, and that chemists as well as mathematicians reason by recurrence. In a passage discussing the law according to which compound substances enter into combination as if they were simple substances, he says: "It is by the method of incomplete induction that we obtain our scientific laws, for it is impossible to make upon a single question all the experiments imaginable, and this would be necessary to establish a complete induction. We therefore generalise these observations, and conclude that in all cases compound substances enter as a whole into other combinations." (Ostwald, *Der Werdegang einer Wissenschaft*, chap. 4.) It is necessary to remark that what is here called incomplete Induction is what I have called perfect Induction, but the logical process is exactly what I have described as the type of all Induction. It is a generalising process which depends upon a synthetic principle and not upon experience. What Ostwald evidently means by perfect Induction is the case in which every possible instance can be verified. But this is impossible except in trivial cases, for the very reason that it is the future we are most anxious to take into account, and these cases are not accessible. Nor is Mathematical Induction any more complete than the example given from chemistry, because it is equally impossible to verify by experience the infinite series comprised in the general proposition. The argument rests, therefore, upon the principle of complete Induction.

There is a portion of mathematical theory which it is necessary to consider in connection with any account of Induction, and that is the calculation of probabilities. The difficulty which all sciences have to face is that of fixing upon a system of concepts which may serve as units just as numbers do in arithmetic and points in geometry. No difficulty arises in these cases, because no external order of things is involved which can disprove our assertions. But all concepts relating to the material universe are portions selected because they seem to embody some characteristic essential to a particular

study. The life history of such a concept as that of "element" shows in what various ways it was attempted to lay the foundation of science, and how the greatest measure of success was obtained when the concept adopted admitted the free application of mathematics. Thales looked upon water as the one element from which the universe was derived. Aristotle, however, supposed that four elements or principles were necessary. The Saracens introduced a system of symbolic elements which represented certain typical qualities of matter. All these notions aided the growth of the study, but the greatest impetus was given when the ideas of chemists became quantitative and so enabled mathematical principles to be applied. The notion of element was fixed by the discovery of the conservation of mass and of the invariability of the chemical properties of a single substance. But when a concept is thus made rigid, although it may be of much greater service to knowledge, it still remains a selection, and must still be part of the whole which is presented in the material world. The physical systems which we have to study are much more complicated than our own mathematical constructions. This fact has an important bearing on the process of induction. It has already been shown that if the enquirer hits upon a suitable concept, chosen after careful choice and well considered experiment, he is then able to apply mathematical notions, and he can reason by recurrence to a general law. But even so it is difficult not to leave out of account some portion of the complicated whole which is presented. If the omitted circumstance were a simple cause it would at first sight be no difficult matter to isolate it and generalise as to its operation, but there are roughly two cases which require exceptional treatment. The omitted condition may produce effects which are very large in proportion to its magnitude, and therefore it may be impossible to calculate them. Or, in the second place, we may omit a multitude of small conditions whose character is so complicated that, again, calculation may be impossible.

It is then to the case of certain residual phenomena that the laws of chance are properly applicable. The opposite view has been taken. Jevons held that all general laws were based upon these laws. He says: "I am convinced that it is impossible to expound the methods of Induction without resting them upon the theory of probability."

This extreme view is, I think, unjustified, and this is shown by the fact that we do not begin to calculate probabilities in all cases of ignorance. In some we attempt directly to find a general law, while in others, especially such as I indicated above, we are content to trust to the laws of chance.

There is no indication in history that the movements of the stars were ever held to be due to chance; on the contrary their motions were thought to be governed by law, although men might have been ignorant of that law. There are several distinct cases then in which the calculation of probabilities is properly applied:—

(1) If a very small error in calculating the original conditions of an experiment produces a very large error in the result, or quite generally if a very small cause produces a very large effect; in such a case it is impossible to predict what will happen, and we say the result is due to chance. This situation occurs very often, and in many different forms. Cases of unstable equilibrium illustrate it admirably. A perfectly symmetrical cone would balance if placed upon its apex, but as is well known, the slightest deviation from a symmetrical position, or the slightest puff of air would be sufficient to disturb equilibrium. Yet the disturbing factor is very small, and the result relatively very great. Similarly, the difficulties of meteorologists arise from the existence of small causes which may produce enormous effects.

A second group of cases is that in which the conditions are very numerous and very complex. According to the kinetic theory of gases the path of a molecule inside a closed vessel will be determined by the original path of the molecule modified by

a very great number of encounters with a very great number of other molecules, and by a very great number of encounters with the walls of the containing vessel. In this case we make use of the laws of probability, not because the complexity is too great for direct calculation, but because the deviation from the original path is very small, and the number of shocks received by a molecule simultaneously and successively is very great.

This illustration leads to another consideration. Strictly speaking, the original path of the molecule is a fiction; so also is any small isolated physical system. And when we come to analyse the conditions affecting the system at the present moment, we are bound in rigour to count a large number of small and complicated conditions, acting, perhaps, through thousands of years. Geology, for example, must take account of such conditions. Here the principle of the degradation of energy comes to the help of purely mathematical considerations. If we accept that principle as that of the whole physical world, we shall be able to conclude that a multitude of small causes will tend to produce uniformity. The meaning of very large and very small in this connection is, of course, quite relative to the present state of knowledge, and there is no doubt that direct knowledge will from time to time encroach upon probability.

The complete application of mathematical thought to the physical universe would result in the conception of the latter as a closed system of material points, in which the whole system at any moment determines the whole system at any succeeding moment. As Poincaré says somewhere, physics is made analogous to astronomy, the planets and the stars become atoms and molecules, while the latter describe courses at least as complicated as their gigantic analogues in the heavens. Similarly, a more limited problem is studied by marking small isolated systems within the whole, and calculating by mathematical laws the succession of states within the system. This way of conceiving either the whole physical world, or a limited

but isolated system within the whole, reduces the notion of causation to that of successive but independent states. Indeed, I should hold that the only true cause in the case was the experimenter who isolated the system. But the mechanical concept of the universe is not altogether securely established, although its employment has been most fruitful. The existence of the unit in such a system, a molecule, an atom, or ion, is hypothetical at the best, and the characteristics of such units are but ill-defined. It often seems as though it were necessary to endow them with all those qualities which enable a mechanical system to be applied successfully. In the latest developments of the notion, an ion scarcely seems to be dead matter at all.

VII.—SOME PHILOSOPHICAL IMPLICATIONS OF
MR. BERTRAND RUSSELL'S LOGICAL THEORY
OF MATHEMATICS.

By S. WATERLOW.

"THAT all pure mathematics deals exclusively with concepts definable in terms of a very small number of fundamental logical concepts, and that all its propositions are deducible from a very small number of fundamental logical principles." The object of his book *The Principles of Mathematics* is, Mr. Russell tells us, (1) to prove these statements, and (2) to explain the indefinable notions which alone occur in all branches of pure mathematics; and in the course of this proof and this explanation he discusses a host of important philosophical points. Although it is now seven years since this book was published, no systematic attempt has yet, so far as I know, been made in this country to estimate its value (admittedly very great) on the philosophical side,—a fact which I cannot but think is a serious reproach to English philosophy, as there is scarcely a philosophical topic which Mr. Russell touches without setting it in a new light. I cannot presume to remove this reproach. Limits of space and ignorance of mathematics force me to make a selection which is in some respects arbitrary. I should have liked, for instance, to discuss the philosophical importance of his proof that mathematical propositions (1) contain no concepts except those that occur in the propositions of symbolic logic and (2) can all be proved, in the sense that they can all be deduced from the fundamental logical principles. I had also hoped to discuss the further question whether we can agree with the suggestion which he makes in his preface, that this proof affords some support to three philosophical positions which he says that he

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assumes as premisses,—namely, the non-existential nature of propositions, their independence of any knowing mind, and the pluralism which regards the universe as composed of an infinite number of mutually independent entities related by relations which are ultimate. The first and third of these “premisses” I shall indeed discuss, however inadequately. But it proved impossible to examine, in a single paper, the connexion of any of them with the proof that mathematics is logic. There is, however, apart from the general thesis that mathematics is logic, one conclusion of great interest to philosophers which Mr. Russell expressly claims to have proved. He holds that the modern mathematical doctrine of infinity and continuity solves all the contradictions which philosophers have discovered in those notions. I propose, then, to explain the philosophical basis of that doctrine so far as I can understand it, and to enquire in what way the proof that infinity is possible bears upon metaphysical problems. And as a preliminary to this task, which will occupy most of the first part of my paper, I shall touch briefly and in a critical spirit on some of the points raised by Mr. Russell in his explanation of the primitive logical notions, selecting from among fundamental points those of which his treatment appears to me least satisfactory. These points, it will be observed, are all connected more or less directly with the notion of “class,” which in the body of his book Mr. Russell accepts as one of the primitive logical notions. Of the other primitive notions some are grouped round the notion of “implication,” others round that of “relation.” Implication—the relation which holds between some propositions whether we perceive it to do so or not, and which, on Mr. Russell’s theory, constitutes the essence of all reasoning—I shall not discuss at all. But in the second part I shall sketch the general problem raised by the notion of “relation,”—a problem which will be forced upon us by the preceding examination of the philosophical relevance of the proof that infinity is possible. Throughout what follows

I have received much valuable help and advice from Mr. G. E. Moore.

I.

Mr. Russell gives us to understand that all the entities of which the universe is composed fall into two classes which he calls "things" and "concepts"; and by "the universe" he does not mean the sum-total of what exists, but (a point which will be elucidated later) the sum-total of everything that can be mentioned, whether it exists or not, and whether it is capable of existence or not. He roughly distinguishes these two kinds of entities, "things" and "concepts," as the objects indicated by proper and general names respectively. Concepts include the entities indicated by adjectives and by the nouns linguistically corresponding to adjectives ("human," "humanity," for instance), and also the entities (usually relations) indicated by verbs and by verbal nouns. Everything else is a thing. This distinction is analogous to the common distinction between substances and attributes, or to that between subjects and predicates; but Mr. Russell insists that it by no means implies the view which, in his opinion, forms the logical basis of most philosophies and is embodied in what he calls the traditional subject-predicate logic, that predicates are in some fashion less real or substantial than subjects. For both things and concepts, subjects and predicates, are alike *terms*. And the word "term" is used in the widest possible sense; anything which can be an object of thought, which can occur in any proposition, which is or can be counted as one, is a term. Every term is a logical subject, and is immutable and self-identical. This doctrine of terms, marking as it does his hostility to all forms of monism, is the very keystone of Mr. Russell's philosophy, and arguments that more or less directly support it are scattered up and down the book. Some of these arguments we shall have to consider later; meanwhile, it may be asked, if concepts are terms and are logical subjects equally with things,

in what does the general difference between them consist? That the difference is important, Mr. Russell certainly seems to hold; for he connects it with his theory of predication, which in turn he regards as important for the logical theory of mathematics. Yet the connexion which he actually notices between his theory of predication and his distinction of concepts from things is slighter than might have been expected; and further, although in discussing predication he raises logical problems which are of great interest in themselves, yet the bearing of the theory of predication on the logical theory of mathematics is far from easy to understand. As to the connexion between concepts and predicates, it is plain, to begin with, that if the distinction between subjects and predicates is to throw light on the difference between things and concepts, it must be by helping us to understand the difference between *all* things and *all* concepts. What we want to understand is in what respect all concepts (*e.g.*, red, goodness, difference) differ as a class from all things (*e.g.*, a point, this red); and accordingly Mr. Russell begins by pointing out a property which concepts alone among terms possess. This property (which, however, has no apparent connexion with the theory of predication) consists in the fact that every concept must have a kind of difference which he calls "conceptual difference" from every other concept. For we must recognise two distinct kinds of difference. One of these, numerical difference, must hold between any two terms whatever; a term, that is to say, must differ from every other term in that it is not one and the same term as any other term. But, in addition to this kind of difference which every pair of terms, without exception, must have, Mr. Russell tells us that there is another kind of difference which must belong to every pair of terms of a certain kind; any two concepts have, over and above the numerical difference belonging to them as terms, a difference which he calls "conceptual." Conceptual differences are absolute and indefinable; the difference in quality between red and green,

for instance, can be perceived, but can not be analysed in any way. This qualitative or conceptual difference between red and green, moreover, seems to have this further peculiarity, that it must distinguish red from every other term; it seems impossible that there should be any term exactly like the concept "red,"—differing, that is to say, merely numerically from it. Consequently, if, when he speaks of conceptual difference as holding between every pair of concepts, Mr. Russell means to imply that this difference, which must belong to every pair of concepts, need not belong to every pair of terms, in that case he will perhaps have succeeded in pointing out an important mark by which to distinguish all concepts from all things. To ensure this, indeed, we shall have to allow to conceptual difference a wider range than that which Mr. Russell actually assigns to it on p. 46. Not only, we shall have to say, must all concepts differ conceptually; but every concept differs conceptually from every thing, and some things may differ conceptually from other things. Between a point and red, for example, and between a point and an instant, there seems to be the same kind of qualitative difference as there is between green and red. But as long as conceptual difference *need* not hold between *every* pair of terms, we shall have a mark by which to distinguish concepts from things: a "concept," we might in that case say, is a term which can not differ merely numerically, but which must differ conceptually also from any other term; and a "thing" is a term which may differ merely numerically from some other term. That is to say, a concept is a term such that no other term can be exactly like it; whereas a thing is a term such that there may be a term exactly like it. And in support of this view of the difference between concepts and things, a remark might be quoted which Mr. Russell lets drop at a later stage, to the effect that things are terms of the kind of which existents consist (p. 212). To define things as terms which can exist, and concepts as terms which can not, falls in with the above interpretation of "conceptual difference,"

because that whatever can exist should have its exact counterpart is, I think, conceivable in a sense in which it is quite inconceivable that many of those terms which are incapable of existence should have other terms exactly like them: *i.e.*, there is, perhaps, some connexion between the fact that the number 2 (say) is a term of the kind that can not exist, and the obvious impossibility that there should be another term exactly like the number 2. But however that may be, there is an obstacle to this interpretation of what Mr. Russell means by "conceptual difference." He sometimes holds language (see, *e.g.*, the last paragraph of § 428) which suggests that he thinks that every term must differ qualitatively from every other term—that no two terms can differ merely numerically, or be exactly alike. And if this is really his view, conceptual difference evidently will not serve to distinguish concepts from things; for the statement as to two concepts that they must differ conceptually, though it will be true, will be equally true of all terms whatever. Thus Mr. Russell's mention of conceptual difference does not seem to throw much light on his distinction between concepts and things; and in point of fact he relies for the explanation of that distinction mainly on his theory of predication. Under that head he points out that some concepts possess a property which no other terms can have. Certain concepts—those, namely, that are linguistically indicated by adjectives—can, he tells us, have to all terms whatever, whether things or concepts, a relation which no things and no other concepts can have to any term. This is the relation* of being a predicate of a subject. All entities, then, will fall into the two classes of (1) terms which can not be predicates (things and the concepts indicated by verbs), and (2) terms which can be predicates (the concepts indicated by adjectives). As to this classification of terms, we may observe that Mr. Russell gives no reasons for it: he simply

* In a note on p. 95 he calls it a "pseudo-relation"; but this seems to be only in order to indicate the fact that it does not form a part of propositions as other relations do.

takes it as self-evident that there are some terms that can not be predicates. Yet the assumption might, perhaps, be doubted. But in any case it would seem that the assertion that things can never be predicates, whereas some concepts can, does not, even if it be true, help to explain what it is that distinguishes *all* concepts from *all* things. The importance of the distinction between subjects and predicates, in the form used by Mr. Russell, must therefore be sought elsewhere than in its connexion with his distinction between things and concepts. No doubt the reason why, while he rejects the view that would reduce all propositions to the subject-predicate form, he yet retains the distinction between subjects and predicates, lies partly in the fact that that distinction appears to throw light on the nature of concepts as opposed to things; and it does in fact seem probable that concepts are connected with predicates in some fundamental way not yet finally explained. At the same time he has another motive for preserving the distinction between subjects and predicates. This is the necessity, arising from the fact that all propositions seem to be complexes, for finding some principle on which all propositions may be analysed into their constituent parts. But it is hard to see what are the constituents of the kind of complex that a subject-predicate proposition seems to be. It is important to realize that a proposition does not consist of words. Every word in a proposition's expression must have a meaning, and the proposition itself is a complex composed of the actual entities indicated by the words. Further, all propositions (so at least Mr. Russell seems to hold) are complexes of a peculiar kind which he calls "unities," to indicate that, though they can be analysed into constituent parts, the whole which the parts compose is different from the sum of the parts: "A differs from B" contains apparently nothing but the parts A, difference, B; yet it is not specified when all those parts are specified. Mr. Russell suggests, however, another way in which propositions might be analysed. May we not, he asks, analyse every proposi-

tion into one or more subjects and one or more assertions about those subjects? There are difficulties in the way of applying this method to propositions like "A differs from B," which assert that a relation holds between two terms: but, on the other hand, in the case of subject-predicate propositions like "Socrates is human" no other method seems possible. For no relation seems to be asserted, and consequently no relation to occur, in these propositions. To mark this fact, he calls propositions of this type "one-term propositions," an infelicitous phrase perhaps, as it tends to obscure his main doctrine, which is that an entity remains one and the same entity whether it occurs as subject or as predicate or as one of the terms in a relational proposition. For instance, in each of the three propositions "humanity is predicable," "Socrates is human," "Socrates defined 'humanity,'" the concept indicated by "human" and "humanity" is one and the same entity. The difference, that is to say, of the three cases from one another does not consist in any "internal" difference in the concepts respectively involved, but is solely a difference in the external relations holding between a single concept and the other parts of different propositions. This much seems to be required by the doctrine that every term is eternally what it is and is a logical subject. And the difference in external relations may be described as follows. When, as in "A differs from B," a relation is asserted to hold between two terms, the proposition, it may plausibly be held, contains the relation in question as a constituent; the relation "occurs" in the proposition and relates the terms. But such a proposition as "A is one" does not seem to assert that a relation holds: it seems only to assert something about A as subject. No doubt a relation which A has to unity is implied; but it is not asserted, and so does not form part of the proposition in the same sense in which difference is a part of "A differs from B." Thus we shall say that the difference between a term's occurrence "as a term" in a proposition and its occurrence "as a predicate" consists solely in the fact that in the

former case our term is related to another term by a relation which is a constituent part of the proposition, whereas in the latter case it is related to another term (the subject) by a certain relation (the same in all cases) which is not a constituent part of the proposition. And this relation is that which was described above when all terms were divided into two classes accordingly as they were or were not capable of being predicates. As to this relation,—the relation which a subject has to its predicate,—beyond pointing out that it does not occur as a part of propositions in the same way as asserted relations occur, and that there are certain terms (namely things and relations) to which no term can have it, Mr. Russell does not succeed in giving any very precise information. He tells us, indeed, that predicates are connected with classes: connected with the predicate “human” are “man” and “all men” and a number of other cognate notions; but the precise nature of this connexion is very difficult to understand. One side of the difficulty becomes apparent when we consider the complication which predicates introduce into Mr. Russell’s general doctrine as to propositions. If all propositions are complexes composed of parts, and if, in subject-predicate propositions, the relation indicated by the copula is not a part of the proposition, then a subject-predicate proposition must be taken to consist of only two parts, the term and the assertion about it. But what precisely is the nature of the entity or entities meant by “is human” when given as an assertion about Socrates? Every genuine word in a proposition’s verbal expression must, Mr. Russell says, have a meaning; and he implies (see, *e.g.*, p. 100) that this meaning will always form part of the proposition. What, then, does the copula in a subject-predicate proposition mean? And further, we may ask, what is the meaning (which must be part of the proposition “Socrates is human”) of the words “is human”? Is, for instance, the cognate notion “a man” part of that meaning or not? It is partly in order to answer such questions as these that

Mr. Russell sets forth in Chapter v his theory of what he calls "Denotation."

Just as in subject-predicate propositions it is doubtful what the "is" means, and in what sense the assertion is part of the proposition, so, in the case of propositions containing in their verbal expressions the words "all," "every," "any," "some," "a," or "the," there is a doubt both as to what exactly the phrases containing these words mean, and as to whether what is meant is a genuine part of the proposition. These doubts give rise to the theory of "denoting," which, though it only partially dissipates them (in particular no satisfactory light is thrown on the question as to what exactly it is that occurs in such propositions as "I met a man," "All men are mortal"), yet requires to be shortly examined because of its connexion with the doctrine of infinity. Mr. Russell has subsequently (in *Mind*, No. 56) re-stated the theory of denoting in an improved form; but I shall confine myself to his treatment of it in this book, which is based on a distinction between the "meaning" and the "denotation" of what he calls denoting phrases. The phrase *all men*, for instance, in the proposition "All men are mortal," means the concept "all men"; but this concept, since it is certainly not what the proposition is about, must presumably be held not to be a part of the proposition. What the proposition is about is the class of men in extension,—the actual collection of all particular men,—which is connected with the concept "all men" in the peculiar way indicated by the phrase "denoting concept": the concept, that is to say, which the words *mean*, *denotes* the object which is part of the proposition. Into the complicated consequences of this distinction between meaning and denotation I cannot enter here; it must be enough to say that, in the article just cited, Mr. Russell abandons it in favour of a view which denies to denoting phrases a meaning over and above their denotation, and which, by recognizing that such phrases have no meaning by themselves, involves a fundamental change in his whole doctrine as

to propositions. In the present chapter his view seems to be that the various denoting concepts in the propositions "All men are mortal," "Every man is mortal," "Any man is mortal," "Some man is mortal," "I met a man," "Thou art the man," all denote one and the same object,—namely a set of terms which are combined in each case in a different way. In each of these propositions, what is denoted by the concept, and what, it would seem to follow, occurs as a constituent part of the proposition,—is *all* the members of the class of men. This of course would be a highly paradoxical view: it seems absurd to say that all the members of the human race occur as a constituent of the proposition "I met a man"; and Mr. Russell's revised theory has the merit of avoiding this paradox. At the same time there is an element in this view which seems to be both true and important, and this is the fact that all the members of the human race are, in some sense, involved in the meaning of each of the above propositions. Whatever may be the correct view as to the nature and composition of those propositions, it seems certain that part of what we know when we know any one of them is something that is true of all the members of a class. In other words, the extension of a class is always involved where a denoting concept occurs; it is this very fact that the "theory" of denoting tries to explain. But might it not be denied that there is anything to explain? Might we not hold that propositions like "All men are mortal" and "Socrates is a man, therefore Socrates is a mortal," assert merely a direct relation between two concepts? This is in fact what is often held, though the view has always been felt to be more or less unsatisfactory; and Mr. Russell points out serious objections to it. On the other hand the alternative to it involves a real difficulty. If we say that, when we know such a proposition as "All men are mortal," we know not merely a relation between the concepts "human" and "mortal" but also something that is true of each of the members of a class, we have to explain how we can know this

without having (as we often do not) each of those members before our minds. According to Mr. Russell it is the function of denoting concepts to make this sort of knowledge possible; and the "theory" of denoting will, by defining denotation in purely logical terms, explain how they make it possible. He does not, it is true, succeed in giving a complete definition in this book; but his description of the functions of denoting concepts shews that they are of fundamental importance for the logical theory of mathematics. Of the various ways in which the analysis of denotation bears on that theory, one only concerns us here. Among the properties defined by mathematicians are those of infinity and continuity. Now whenever these properties occur we have collections as to which, since it is impossible to inspect all their terms one by one, we could have no knowledge at all if the only way of obtaining knowledge were the direct inspection of single terms. But denoting concepts, by providing another way of obtaining knowledge about collections, make the consideration of infinite collections possible. To recognize denoting concepts is thus to take a first step towards disposing of the difficulties connected with infinity. For instance, the validity of an inference about all points may seem more doubtful than that of an inference about all men or a man. Yet, practically, both are on the same footing: in practice it is no more possible directly to apprehend each individual man than it is to apprehend each individual point. In both cases our knowledge depends on a denoting concept, which, if it can give us genuine knowledge about all the many members of a finite class, may give us equally genuine knowledge about all the many members of an infinite class. If the proposition about all men seems to present no difficulty, that is only because we are more familiar with finite classes: the theory of denoting points out that the difficulty of seeing how we can mean (as we seem to do) every single one of the members of a class without having each of them before our minds, is a

difficulty which is not confined to infinite classes. In short, we may say that the possibility of dealing with classes at all, whether finite or infinite, depends on denoting concepts. The importance of giving a correct logical analysis of propositions involving these concepts is thus obvious, and it is an interesting fact that Mr. Russell, in spite of much discussion, is compelled to leave this task unfinished. Not only is his theory of denotation defective as it stands, but he discovers several logical antinomies centering round the notion of "all" which he confesses himself unable to solve.* In his Appendix, however, he suggests a solution, which he has since worked out more fully (see *American Journal of Mathematics*, vol. xxx, and *Revue de Métaphysique et de Morale*, September, 1906). This development is very important, as it involves the abandonment of "class" as one of the primitive logical notions and the re-casting of the whole doctrine of propositions; but, as I have not been able fully to understand what it is that Mr. Russell now substitutes for the notion of "class," I can say nothing about this. I must assume that the notion of "class" or "all the so-and-so's" is valid, and I shall now proceed to sketch the theory of cardinal numbers, of order and of infinity, of which he originally made it the basis. At the same time I am conscious that the new theory has probably made much of this paper obsolete.

The first question to which Mr. Russell turns after explaining the primitive logical notions which are, he thinks, the only constants occurring in all the branches of mathematics, is one which seems to lie on the threshold of any philosophical analysis of the ideas employed in mathematics. This is the question, What are numbers? From the philosopher's point of view his treatment of this question is, perhaps, not quite satisfactory. Of the views as to the nature of number which

* Anyone who wishes to understand these contradictions should observe a confusing misprint on p. 102. In line 19 from the bottom for "classes that have" read "classes that do not have."

might be held by philosophers he only discusses two explicitly. It is sometimes held that, in one way or another, numbers are to be defined by reference to the process of counting; and Peano would define a number as *the* common property of similar classes. Both these views Mr. Russell rejects. And while his reasons for rejecting the second of these views do not seem to me conclusive, his objections to the view that would make numbers depend on counting are summary and straightforward; any such view must, he urges, be false, because it imports an irrelevant psychological element, presupposes the objects to be defined, and can in any case only apply to finite numbers. But it is certain that other philosophical views than these as to the nature of numbers have been and can be held; and as Mr. Russell's own definition is not, it would seem, put forward as a description of what numbers really are, the reader who looks for a solution of the problem in this book will be disappointed. He will also be surprised; for where, it may be asked, if not in a book on the fundamental ideas of mathematics, should we look for a definition of what numbers really are? The fact seems to be that Mr. Russell's theory makes it unnecessary for him to assume that numbers actually occur in any branch of mathematics. All that is necessary is that, by means of the primitive logical notions, he should be able to define a class of entities having such properties that all propositions are true of them which seem to be true of numbers; and it is not necessary that these entities should actually be what we mean by the word "numbers." This, accordingly, is what he does. Using none but the primitive logical notions, he defines a class of entities which permit the deduction of all the usual properties of numbers, whether finite or infinite, and which consequently are *equivalent* to the cardinal integers, though there may be no reason to suppose that they are *identical* with them. The definition is as follows. We define, as holding between classes, a relation called "similarity": two classes are said to be similar where there is a one-one

correlation between their terms, *i.e.*, when to each term of the one class there corresponds one and only one term of the other.* Then all classes similar to a given class form a class; and this class—the class of classes similar to a given class—Mr. Russell decides is the number of the given class. The class of cardinal integers is thus the class of all classes of similar classes. And certainly, unless we bear in mind that he is not trying to give a philosophical description or definition of the concept “number,” this statement cannot but seem paradoxical; for when we talk of (say) the twins Castor and Pollux we don’t apparently mean, in any ordinary sense of the word, that the class which they compose is a member of the class of classes similar to it. All that Mr. Russell intends to assert, however, is that there is a certain entity exactly equivalent to the duality of the twins. That is to say, they are 2; and there is an entity, containing in its definition no concepts except such primitive logical notions as “class,” which, in any proposition in which the number 2 occurs, can be substituted for the number 2 without in any way affecting the truth or falsehood of the proposition. Moreover, if all propositions about the number 2 are stated in terms of classes of similar classes, all such propositions can be given a full and consistent logical interpretation; and only so, he seems to say, can they be completely interpreted. As to this last point, though, doubt seems possible. Mr. Russell, while admitting that his classes of classes are, perhaps, not identical with the integers, does not make it clear that there are no *other* entities that are equivalent to the integers. For instance, he does not satisfactorily explain why he rejects the particular entity which he tells us that Peano thinks is the number of a class. Peano’s view, as stated by Mr. Russell, seems to be that the number of a given class actually is a certain property which the given class shares

* A one-one correlation can be defined without reference to the number one. For the sake of simplicity I omit consideration both of the class that has only one member and of the class that has no members.

with all the classes similar to it and with no other entities whatever,—the view, in fact, which I mentioned above as one of the philosophical definitions of number which Mr. Russell discusses and rejects. Now, as a philosophical definition, this statement seems, on the face of it, plausible: that the number of the class composed of Castor and Pollux actually is a property which is common and peculiar to it and to the classes similar to it, is at any rate not a paradoxical view. It is not paradoxical, because numbers do seem to fulfil the conditions laid down in the definition: every class of many terms certainly has a number, a given class certainly has the same number as have all the classes similar to it, and a given class certainly does not have the same number as any class that is not similar to it. Mr. Russell's definition also, to be sure, says that numbers are (in a sense) common properties of similar classes; yet, regarded as a description of what numbers actually are, Mr. Russell's definition is more paradoxical than Peano's. For, on Mr. Russell's definition, that "property" of a class which is taken to be its number is simply the sum-total of all the classes similar to it. On the other hand, the property which Peano identifies with the number of a class is not, I think, itself a class. Mr. Russell shews (see pp. 166, 219) that, whenever there holds between two or more entities a relation which, like that of similarity between classes, is such that, if A has it to B, then B has it to A, and if A has it to B and B to C, then A has it to C, and is also such that A has it to itself,—whenever a relation of this kind holds, he shews that it can be proved that there must be some one entity to which A, B, and C each have a relation which they have to nothing else, but which all the terms related in the above way (and no others) have to the entity in question. This definition gives the precise meaning of the phrase "a common property." To say of two or more terms that they have a common property is to say both that there is some one term to which each of them (and no other terms)

has a relation which it has to nothing else, and that there holds between the terms some relation of the sort just defined. And these two assertions, according to Mr. Russell, are such that whenever one of them is true the other must also be true; whenever a relation of the same type as similarity holds between a set of terms, there must, he shews, be a single entity which may be called a common property of the terms in question, and *vice versa*. From a relation like similarity a common property can, in short, always be inferred; and it is this entity,—the particular property which similar classes must have in common in virtue of their similarity,—that Peano apparently would identify with the number of similar classes. What, then, is the objection to taking this common property which, according to Mr. Russell, a set of similar classes must have in virtue of their similarity, to be equivalent to, if not identical with, the number which each of a set of similar classes must have? The objection is not that the entity thus defined would not permit the deduction of the properties required by mathematics; for that it would not do this Mr. Russell does not attempt to shew. The reason he gives for rejecting this entity is that we want, if our logical complex is to be equivalent to the number of a class, one unambiguously defined entity, and that “definition by abstraction” (as the above process is called) can never give one entity, but always gives a class of entities, from among which there will be no way of choosing that one which is the number. But is it really impossible that the argument from abstraction should give us *the* common property of similar classes which a number is? Mr. Russell’s language in the passages where he explains the argument from abstraction seems to me to justify a doubt on this point.* Of course if we consider all the relations of the same kind as similarity which may hold between similar

* See especially p. 305, where he explains that the principle of abstraction *can* give a definition of cardinal numbers.

classes, we obtain a class of common properties corresponding each to one and one only of the relations in question; but to the particular relation of similarity there must, it would seem, correspond one and one only common property; and *this* entity—the single entity to which similar classes are related in virtue of their similarity—it is plausible to suppose is actually the number of a given class. Thus, in respect of its being unambiguously defined, Peano's common property will, if I am right, have at least as good a claim as Mr. Russell's class of similar classes to be considered as the number of similar classes. And whether its claim is as good in other respects,—whether it would permit the deduction of the required properties of numbers,—is a question which he does not discuss. To sum up. His treatment of the question What are numbers? seems unsatisfactory, because, while his object is not to give a philosophical definition of the concept “number,” but to define, in the mathematical sense of the word, a class of entities which shall have all the properties of the class of the cardinal integers, he does not succeed in showing that the class he defines is the only one that can have those properties. It seems to me (though I make the suggestion with diffidence) that Mr. Russell himself implies that the class of entities defined by Peano may be equivalent to the class of the cardinal integers; and it can be supposed to be identical with it with more plausibility than can Mr. Russell's “classes of similar classes.”

However that may be, his discussion of the nature of number serves to make plain the first essential step in the development of mathematics from the primitive logical notions. This is the definition of the relation of similarity between classes. It is not necessary, in order to show that all mathematics is logic, to deny that the number 1, for example, is a simple unanalysable concept: the denial is not necessary so long as there is an entity, definable in terms of the primitive notions, which is equivalent to the number 1. Thus Mr. Russell

mentions, as equivalent to the number 1, the following complex : the class of all those classes of which each is such that it has a member x such that the proposition " y is a member of the class in question and y differs from x " is always false. It is not necessary that this entity should be identical with the number 1 ; nor (it would seem) is it necessary that this should be the only entity equivalent to that number. It is sufficient, in order to establish a logical theory of mathematics, that there should be some entity, definable like this in purely logical terms, that is equivalent to the number 1. And this equivalence will be sufficient, because to say that some such entity is equivalent to a given number means that, connected with this entity, a whole series of complexes can be formed in the same way, which can be proved to possess all the properties of numerical series. In this way a logical expression can be found for such operations as addition and multiplication, and a precise statement can be given of the properties of finite and infinite numbers. Now, although the possibility of these developments does not (it would seem) depend on the assumption that classes of similar classes are the only complexes equivalent to numbers, yet, on the theory adopted by Mr. Russell in this book, classes and their similarity seem necessary to the definition of number in this sense, that the full logical expression of all mathematical propositions will involve the notion of class and the relation of similarity. As to the method of expressing the ordinary arithmetical operations in these terms, I need say nothing : the topic is only interesting to logicians. The definitions of finite and infinite numbers, on the other hand, will require, in view of the philosophical consequences of the mathematical doctrine of infinity, to be briefly stated.

To understand the difference between finite and infinite numbers, we must further consider the relation of similarity between classes, and ask ourselves whether it is possible that a class should contain as a part a class which is similar to the

whole class. With some classes this is plainly impossible. Everyone is acquainted with many classes which are obviously such that, if we take away one or more of their terms, all the terms that remain can not be correlated one to one with all the terms of the original class; indeed, we are so much accustomed to such classes that we are prone to suppose that all classes must be of this nature. This supposition, however, would be rash. For it can be proved that this property, which some classes certainly possess—the property of containing no parts that are similar to themselves,—is equivalent to another less familiar property, which it is not obvious that *all* classes must possess, though it is obvious that *some* classes do possess it. This less familiar property is that which may be expressed in popular language by saying that the number of any one of the classes in question is a number which can be obtained from 0 by successive additions of 1; and this condition, though it is obvious to common sense that the numbers of *some* classes can thus be obtained, is not, perhaps, one which common sense would imperatively require *all* classes to fulfil. Consequently, when it is proved that for a class to obey mathematical induction (as the possession of this less familiar property is called) is the same thing as for it to contain no part that is similar to itself, it should become more credible to common sense that some classes may contain parts that are similar to themselves—parts, that is to say, having the same number of terms as the wholes of which they are parts. And it may further help to make this credible if we consider a class where it is easy to see that mathematical induction is out of the question. It is obvious that the number of all the cardinal integers is not a number which can be obtained from 0 by successive additions of 1; for, however many steps we take, we never reach the number that we want. Also, it is obvious that the class of all the cardinal integers contains a part that is similar to itself: for, if we could add 1 to each of the cardinal integers (including 0), we should obtain a new

class, of which each of the terms would be correlated one to one with each of the terms of the original class; yet the class obtained, since it fails to include one of the terms of the original class (namely, 0), is only a part of the original class. And in this case it seems plain that there is some connexion between the two properties we are discussing: our failure to obtain the number of the cardinal integers by successive additions of 1 seems to be only a less paradoxical way of expressing what yet, we see, must be the fact, that "all the cardinal integers" is a whole containing a part which contains the same number of terms as the whole. In any case, this instance shews that neither obedience to mathematical induction, nor the well-known property of containing no parts but those which contain fewer terms than themselves, are universal properties of classes; and this fact gives the mathematician two equivalent definitions of infinite and finite numbers respectively. If a number (1) does not obey mathematical induction, and (2) is the number of a class containing any part similar to (*i.e.*, with the same number of terms as) itself, it is said to be an infinite number; otherwise it is said to be a finite number.

With this result we should now be in a position to discuss the bearing of the logical theory of mathematics on the philosophical difficulties connected with infinity, were it not that the objects which raise these difficulties, and as to the nature of which there has always been dispute among philosophers, all have one peculiarity: they all of them—quantity, space, time, matter, and motion—seem either to be series or to involve series in their consideration. Now, of the distinctive properties of series no mention has yet been made. The above definitions of finite and infinite number contain nothing except what is required for the theory of cardinal numbers, which are the numbers of classes in which the order of the terms is irrelevant. Hitherto, the only relations which we have assumed to hold between terms have been such as may be involved in saying,

of any collection of terms, that they are the members of a class. But ordinal relations must now be introduced. Everyone is familiar with collections of which each of the terms seems, as it were, to have a definite position assigned to it, and usually in such a way that, given two or three of the terms, the remainder seem to be determined. The integers or the points on a line are examples: there is evidently, over and above the fact that each integer or each point is one of a certain set of terms, some bond between every integer or every one of the points on a line, in virtue of which they are arranged in an order. From the mathematical point of view the nature of this connexion is exceedingly important. The whole of ordinary arithmetic can be based solely on the serial properties of the finite numbers, *i.e.*, on those properties in virtue of which they form what is called a progression. Moreover, the analysis of order, by generalising all statements about quantities, so that they become theorems concerning the properties of certain series, alone makes it possible to treat geometry and dynamics strictly as branches of pure mathematics. More relevant, however, to our present purpose (since philosophically the problem of the continuum is scarcely separable from that of infinity) is the fact that the definition of continuity depends on the analysis of order. We have seen how the definitions of the cardinal infinite are obtained from the primitive logical notions of "class," "any term" and "relation"; we have now to see how continuity also, though involving the notion of "order," yet requires for its definition none but the logical indefinables.

It is clear, to begin with, that, if we are to avoid introducing any new indefinables, the notion of order must be definable in terms of the primitive logical notions. That it is thus definable Mr. Russell establishes by pointing out that order arises whenever one term is between two others, and by arguing that "betweenness" is not a single specific relation, but is a name for any relation of a certain kind. And the kind of

relations, any one of which constitutes "betweenness," may, he thinks, be defined as follows. A term, B, is between two other terms, A and C, whenever A has to B and B to C any relation which A has to C, and which B does not have to A nor C to B. A relation which is such that, if A has it to B and B to C, then A has it to C, is called "transitive"; and one such that, if A has it to B, then B does not have it to A, is called "asymmetrical." All order thus depends on the presence (which, Mr. Russell decides, constitutes the very meaning of the word "between") of some transitive and asymmetrical relation. Examples of relations that are transitive and asymmetrical are "to the left of," "to the east of," and all comparatives, such as "greater than." To say of any set of terms that they form a series is therefore to say that some relation of this kind holds between* them. Moreover, it is only in virtue of their being related by some such relation that any particular set of terms becomes fully amenable to mathematical treatment; we might even (if I understand Mr. Russell aright) sum up the whole of the rest of mathematics after the theory of numbers by describing it as the discovery and definition of the various very complicated relations holding between the entities which relations of the above kind define. With this remark, designed to indicate roughly the mathematical importance of the theory of order, I pass to the definition of continuity.

Under the heads of infinity and continuity mathematicians have defined certain properties which at first sight it seems impossible that anything should possess, because to suppose that anything is infinite or continuous in the senses defined is to suppose that it has (among other properties) two properties which seem incompatible, *i.e.*, which are such that its possession of the one seems to imply that it does not possess the other. Mr. Russell's object is not only to shew that the properties

* The sense in which a relation holds *between* its terms seems, as Mr. Russell points out, to be a different sense of the word "between" from the sense in which one term is *between* two others.

defined are not thus incompatible, but also to shew that the contradictions which philosophers have discovered in the notions of infinity and continuity can all be reduced to these illusory incompatibilities. For the understanding of this argument it will be unnecessary to give the full definition of the mathematical continuum. Cantor has defined a complicated property (I gather that it is called "perfect" continuity), which belongs to certain series; but this property need not be considered here, as everything which possesses it will also possess a much simpler kind of continuity which by itself involves consequences that seem impossible to common sense. Every perfectly continuous series has a property called "compactness."* And the definition of compactness is as follows: A series is compact when between any two of its terms there is a third term. Thus, remembering the definition of "between," we see that a compact series is a set of terms such that any two of them are related by some transitive and asymmetrical relation (it is this property which makes the set a series), and, further, such that, whichever two we choose, there is always some third term which has to one of the two, and to which the other of the two has, the same relation. Now in this there seems to be nothing either self-contradictory or difficult to understand; yet, if we admit that anything may be a compact series, consequences shocking to commonsense seem to follow. In the first place, whatever is a compact series must be a whole containing a part having the same number of terms as itself,—a paradox which we have already met in discussing the definition of infinity, and which, in the case of series, can be shewn to follow directly from the assumption of a third term between any two terms. And it certainly does seem impossible that this property (even when we remember its equivalence to the less incredible property of disobeying mathematical induction) should belong to anything whatever, because it seems to contradict the axiom that the whole is greater than the part.

* The converse is not true.

Mr. Russell, however, argues that it is not inconsistent with the axiom of whole and part to suppose that a mere part may contain the same number of terms as its whole; for to say that A is greater than B is not the same thing as to say that A has a greater number of terms than B; so that, unless we are prepared to assert that "magnitude" and "number of terms" are one and the same notion (and it seems plain that they are different), we must admit that A's and B's having the same number of terms may be compatible with various suppositions as to their relative magnitudes. In short, in the sense of having a greater magnitude, the whole must always, perhaps, be greater than its part;* but there is no reason why it should always be greater in the sense of having a greater number of terms. On the contrary, Mr. Russell shews that there must be collections, parts of which contain the same number of terms as the number of the terms of the whole collection; and such collections, since the number of their terms is infinite by definition, will themselves be said to be infinite. But, in addition to this paradoxical property which compact series share with all collections (whether series or no) of an infinite number of terms, the compactness of a series involves various other properties, peculiar to series, which it might be supposed impossible that anything should possess. Of these it will be well to consider two that seem to have special significance for philosophy. (1) There must be, if any series is compact, such a thing as all the terms of a series which yet is endless. This is involved in compactness, because, if there is a term between any two terms, whichever two terms we choose there is another term between them, and so on *ad infinitum*; so that between any two terms there must be all the terms of a series which has neither beginning nor end. And this supposition, again, is not self-contradictory: the assertion, as to any set of terms, that they are all the terms of a certain kind,—all the terms,

* This will not, of course, be true for wholes that have no magnitude.

for instance, between two specified terms,—does not by itself involve the assertion that of these terms one must be the first or one the last. Yet, that there should be such a thing as all the terms of an endless series, may easily be made to appear impossible. There is, for instance, no objection, Mr. Russell thinks, to supposing that spaces and times have the kind of continuity defined by Cantor. But, if so, they will either themselves be, or include as parts of themselves, series possessing (among other properties) that of compactness; and in that case motion through a space or duration through a time will involve the supposition that all the terms of some endless series are reached. And that this is possible has, naturally enough, often been denied,—by Zeno, for instance, when he argued that Achilles cannot overtake the tortoise because to do so he would have to pass through all of an endless series of positions, and by Kant when he argued that the world must have had a beginning in time. The world must have had a beginning in time, because particular points of time certainly are reached; which could never happen if, before it reached a given moment, the world had to pass through all of an endless series of moments: and similarly, since Achilles does overtake the tortoise, it is natural to infer that he does not perform the impossible feat of reaching all the positions in an endless series. And the inference is the more natural because it seems to be only another way of saying something obviously true because tautologous,—namely, that it is impossible to reach the end of a series which has no end. But to say that a series has no end is (in one sense of the word “end”) merely to say that, its terms being related by some transitive and asymmetrical relation, there is no term of the series to which all the other terms of the series have that relation, and which itself has it to none of them; and to say this, plainly does not involve the denial that there is such a thing as all the terms of the series. And if there may be such a thing, no reason can be given why all of the terms should not be reached. Thus it is possible to

hold without self-contradiction both that the positions which Achilles must occupy in order to overtake the tortoise form an endless series, and that he occupies all of them. At the same time there is certainly some sense in which, when Achilles overtakes the tortoise, the end of a series is reached; periods of time come to an end, lines have end points, and so forth; and the fact that so many series with which we are familiar have ends, since it renders plausible the supposition that no series can be endless, may easily be taken as confirming the opinion (which, though natural, we have seen to be groundless) that there can be no such things as all the terms of an endless series. The mathematical analysis of the continuum, however, by precisely defining the notion of "end," removes this difficulty also. Endless series, though *ipso facto* they themselves have no last term, may yet have "ends," in the sense that all the terms of a compact (and therefore endless) series may come before some term of a series which includes the compact series as part of itself. And it is in this sense that lines and periods of time will be said to have ends, if we suppose that points and moments form compact series. The last point of a line will be the point which is preceded by all the members of some compact series of points; this point is the end of the line, although all the terms of an endless series precede it, in the sense that it comes after all the other points. Here, again, it must be admitted, there is no contradiction. If there is no reason for rejecting the notion of all the terms of an endless series, why need we deny that these terms may (although no one of them is the last) all come before some term in a series of which they form a part? But (2) it may be said that to suppose this involves, over and above the notion of all the terms of an endless series (which we have seen to be unobjectionable), a further consequence in hopeless conflict with common sense. The essence of a series, it would seem, is to have consecutive terms; yet now we are assuming that there may be a term which has no term next before it. For if the end point of a line is a point

which is preceded by all the members of some endless series of points, there can be no one of these that comes next before the end point: no member of the endless series can be next to the end point, because, whichever member we choose, there will always, since the series is endless, be another between it and the end point. Our point, in short, will have no immediate predecessor. Further, it is clear that this property must belong to every term of a compact series; for, since a compact series is one in which there is a term between any two terms, there can be no term either immediately before or immediately after a given term: in compact series there can be no consecutive, in the sense of immediately consecutive, terms. And this state of things seems to be impossible, because when we say that a particular set of terms forms a series, we do seem always to mean that they come immediately after one another. Here, again, Mr. Russell's reply is twofold. In the first place, that a series should have no immediately consecutive terms, is certainly not impossible in the sense that the supposition is self-contradictory. For to say of any set of terms that they are consecutive or form a series, is merely to say that they are related by some transitive and asymmetrical relation. Then, given any term (not the first or last) of such a set, we say that there are many terms having that relation to it, and many to which it has that relation; and, among the terms having the relation to it, we deny that there is any one such that it has the relation only to the given term and to the terms which do not have the relation to the given term. This denial gives the precise meaning of the supposition that there is no term immediately before a given term; and it certainly seems to involve no contradiction. In the second place, Mr. Russell explains why nevertheless it should *seem* to be impossible that a series can have no immediately consecutive terms. This seems impossible, because it *is* impossible that the terms of most of the series with which we are acquainted in every-day life should not come immediately before and after one another. Where the number of terms in a series is finite,

it can easily be proved that there must be a term next before and next after every term not the first or last ; and, being pre-occupied with finite series, we naturally suppose that this property must belong to all series. There may, of course, be other reasons for thinking that no series that exist can be without immediately consecutive terms ; but the above analysis of the notion of immediate consecutiveness shews that, if anyone holds that something actually is a series with no immediately consecutive terms, he cannot be refuted on the ground that he is contradicting himself.

The above discussion is an attempt to give in non-mathematical language the gist of Mr. Russell's various proofs that infinity and continuity, as defined in modern mathematics, involve none but the primitive logical notions, and are free from contradictions. To recapitulate. Starting from the relation of similarity between classes, we define classes with an infinite number of terms as those which contain any part having the same number of terms as the whole. We then introduce the notion of order, and say that series are those classes which are ordered, *i.e.*, all the terms of which are related by some transitive and asymmetrical relation. Of the properties of series we particularly discussed one, namely, compactness, which must belong to everything that is continuous in the mathematical sense ; and it was plain that, since between any two terms of a compact series there is another term, anything that is a compact series must be a class of an infinite number of terms in the sense just defined. Thus the definition of a compact series involves none but the primitive logical notions,—*e.g.*, “any term,” “class” and “relation.” Nor is it self-contradictory. No contradictions, at any rate, were discovered in the difficulties that arose at various stages of the argument. The supposition that there is such a thing as a collection of an infinite number of terms involves, it is true, a seemingly impossible consequence ; and so does the supposition that there is such a thing as a compact series. It follows from these suppositions that there is such a thing as a

whole having no more terms than its part, such a thing as all the terms of an endless series, and such a thing as a series having no consecutive terms. But these consequences proved to be in no sense self-contradictory. They only seem to be so, because they do not follow from the properties of collections with a finite number of terms; and, being more familiar with finite collections, we are prone to think that no collection can have a property which a finite collection cannot have.

If Mr. Russell's only object were to show that the doctrine of infinity, of which the logical outline has now been roughly sketched, is necessary and sufficient for mathematics, the length at which I have dwelt on this topic could scarcely be justified. My excuse is that not the least merit, in his eyes, of this doctrine, is the fact that it provides the key to many difficulties that have puzzled philosophers. Thus he takes the paradoxes of Zeno, for the refutation of which, he says, no apparatus existed before the foundation of the modern doctrine of infinity by Weierstrass, and shews that they all depend on the assumption that some property which really belongs only to finite series belongs to all series; and he takes Kant's spatio-temporal antinomies and shews that they depend on the attribution to all collections of some property of finite collections. Further, all the philosophical difficulties connected with the notions of infinite quantity and the infinitesimal can, he seems to think, now be finally solved. To obtain a clear idea as to the bearing which the proof that no contradictions are involved in the notions of infinity and continuity as defined above has on all the problems of quantity, it would be necessary to explain Mr. Russell's theory as to the meaning of "magnitude"; but there is one kind of philosophical difficulty which, merely from what has been said about the properties of continuous series, can be seen to lose its sting. If those properties are really free from contradiction, it is plain that, whatever the characteristics of quantities or magnitudes may be, if we have a series of magnitudes which is such that there is always a magnitude

greater than any given magnitude, and such that there is always a magnitude less than any given magnitude (as, *e.g.*, appears to be the case with distances in space and time), this fact does not imply that the magnitudes, of which it seems to be true, do not form a genuine series. For there is no contradiction, as we have seen, involved in supposing either that a series may have no first and last terms, or that there is always a term between any two terms of a series. Hence there is no need, in order that our series may be well-defined, to posit last terms and to call these last terms infinite or infinitesimal magnitudes; and the contradictions which arise from the supposed necessity of such a state of things thus cease to be formidable. Whether the mathematical doctrine of infinity is capable, as Mr. Russell seems to think it is, of meeting all the philosophical difficulties connected with continuity, is a further question involving so much detail that I have no space (even if I had the power) to discuss it here. I hope, however, that I have said enough to illustrate at least the main features of the method by which he seeks to prove that (contrary to what has often been held) infinity is possible, in the sense that it involves no contradictions.

I come now to our principal question. In what way does the proof that infinity is possible throw light on the philosophical problem to which it seems at first sight to be especially relevant? Can it, that is to say, help us to come to any conclusion as to the nature of what exists? Philosophers must regret that in this connexion Mr. Russell usually (though quite properly, since his book is not a treatise on metaphysics) leaves much to "the sagacity of the reader"; it is, for example, by no means easy to discover to what extent and in what sense he thinks that his conclusions corroborate that account of the world of existents which he seems himself inclined to accept and which he indicates as being at any rate a logically impeccable account. Three points, however, seem clear. (1) He claims to have shewn that there is no force in the

arguments which have been chiefly responsible for the adoption of certain views as to the nature of the universe. (2) He does not think that his arguments afford any conclusive evidence that any particular thing exists. (3) At the same time there are certain things, often supposed to exist, as to the nature of which, if they exist, he thinks that something can be proved. I will take these points in order.

(1) In the first place, if any philosopher has ever drawn, from the contradictions involved in supposing anything to be an infinite collection or a continuous series, any such inference as that time and space, for instance, are unreal, Mr. Russell offers a proof that that inference is unjustified. That is to say, by shewing that on careful analysis all these alleged contradictions vanish, he shews that any view that should be supported solely by these contradictions will be, so far, without a vestige of evidence. And there is, I think, another kind of view which, in a similar way, Mr. Russell incidentally shews to be baseless. If any philosopher has held that no term whatever can be indivisible, and on the basis of this supposed necessity—the necessity that everything should be divisible—has constructed a theory about the nature of what exists, this theory too, Mr. Russell thinks, cannot be well founded; not only are some concepts (*e.g.*, red), according to him, indivisible terms, but relations are not even conceivably divisible (p. 162); and relations, he argues, are some among terms. The question whether his argument that relations are genuine entities has a wider scope than this I postpone for the moment. The point I wish to note here is that it involves the indivisibility of, at any rate, some terms, and consequently affords, if it is sound, and if all (or even if any) relations are indivisible, a proof that theories about the nature of what exists which depend on the divisibility of all terms are, so far, ill-grounded, just as his solution of the antinomies affords a proof that theories about the nature of what exists which depend on the alleged difficulties of infinity and continuity are, so far, ill-grounded.

(2) But these results, even if Mr. Russell can make them probable, are, taken by themselves, purely negative in their bearing on the question, What is the nature of reality? What the solution of the antinomies can prove is, for instance, that there is no logical objection to supposing, as to a collection of indivisible terms, that it contains a part having the same number of terms as itself, that it is a compact series, or that it contains compact series as parts of itself. These properties of collections, Mr. Russell shews, correspond to different senses in which collections may be said to be "infinite" or "continuous"; and they involve no contradictions whatever. Consequently the supposition, as to any existent, that it is a collection of an infinite number of indivisible terms having some or all of the properties defined under the heads of infinity and continuity, may be said to be open, so far, to no logical objection. Thus Mr. Russell, as we have seen, shews that it is in a sense possible that an existent should be a collection of indivisible terms, since he argues that not all terms must be complex; but though he shews this, and though he also shews that it is possible that an existent should be a collection of terms having the various properties defined as constituting infinity and continuity (since he shews that these properties are not self-contradictory); yet no presumption is thereby raised either that there is, has been or will be an existent which is a collection of indivisible terms, or that, if a collection of indivisible terms exists, has existed or will exist, it has any of the properties defined. For, to raise either of these presumptions, it would be necessary either to assume or to prove, as to some existent, that it existed; and this Mr. Russell does not do, because he abstains from all considerations drawn from "experience." And there is a further sense in which his results may be called negative so far as what exists is concerned. I shall presently try to shew that some of his arguments may be regarded as perhaps proving that if anything exists, it must be either an indivisible term

or a whole composed of indivisible terms, although this is not a conclusion which Mr. Russell himself draws. But even if this can be proved, it will not follow that the supposition as to any existent (being an aggregate of indivisible terms) that it is infinite or continuous is free from all difficulty. This will not follow, unless it is certain that the properties defined by Mr. Russell as possibly belonging to collections of indivisible terms—properties which he shews to be free from contradictions—are the only properties that can be meant by the words “infinite” and “continuous.” In the absence of that certainty he must admit it to be possible that still other difficulties lurk in the notion of infinity,—that he has not, in fact, removed all the possible objections against his view that there is now no reason why we should not suppose that certain existents may be infinite or continuous collections of indivisible terms. Still, the objections to this view which he has removed are of great importance. Even thus qualified and limited, his conclusions strike at the root of widely-held opinions as to the nature of what exists, and are thus of the highest philosophical interest.

It is worth noticing, however, that Mr. Russell, while he treats the solution of the antinomies of infinity, taken by itself, as only allowing a negative conclusion as to the general nature of what exists, yet seems to think that there is one thing, among those often supposed to exist, towards which the solution of the antinomies may entitle us to adopt a more positive attitude. He indicates as regards space an argument which, if it is valid, might make it reasonable to hold that space actually is a continuum of the kind defined by mathematicians. For some of the properties which actual space is known to possess are such, we are told, that the continuum defined by Cantor would, if it were actual, be empirically indistinguishable from the space which we actually perceive; and the fact that series of points possessing the properties of the mathematical continuum would differ in no discoverable

way from the space in which we seem to live, does seem to raise some presumption that that space is such a continuum. But philosophically this argument is less important than it seems at first sight; for it leaves undecided a point of great interest. It will indeed, even so, still interest anyone who thinks both that a space of some kind exists and that, since the solution of the antinomies, no good reasons can be given for denying the existence of space; it will perhaps give anyone who holds both those positions some reason for thinking that space actually has the properties possessed by the mathematical continuum. But it will not help to determine the nature of the elements of the continuum. For it is, as Mr. Russell points out, irrelevant to the argument whether the elements of the space-continuum are indivisible points or not. As far as the solution of the antinomies of infinity goes, the infinite and continuous series, which are proved to involve no contradictions, may be series of complex terms, though they may equally be series of indivisible terms; so that the (philosophically) very important question whether the terms of any particular series that may be thought to exist are indivisible or not must be decided independently. Whether any of Mr. Russell's arguments can help to decide this question I shall consider later.

(3) In any case we thus see that the general negative conclusion justified by the solution of the antinomies is not the sole contribution made by Mr. Russell to metaphysics in this book. Moreover, he indicates two lines of argument, which are connected with that solution in various ways, either of which would, if valid, establish positive metaphysical conclusions of general importance. There is first (*a*) the line of argument which I began by regretting my inability to examine. He suggests in his preface that the doctrines that the nature of propositions is not solely existential, that reality is independent of any knowing mind, and that the universe is a plurality, stand to his mathematical conclusions in the relation of

premisses, and that those conclusions are such that they in turn afford some evidence for the truth of the premisses. The argument would seem to be that the premisses in question are in some way necessary for the proof that mathematics is logic, and that consequently they are necessary for the proof that mathematical propositions are true, since only if mathematics is logic can those propositions be proved to be true. Hence, as many mathematical propositions are admittedly true, the truth of mathematics will raise some presumption in favour of the premisses. Whether this argument (it is merely suggested by Mr. Russell) would bear examination, is, I think, doubtful; in particular I feel a doubt as to the possibility of demonstrating any connexion between his mathematical conclusions and the objectivity of reality. For the other two positions, however,—the non-existential nature of propositions and the plurality of the universe,—Mr. Russell also advances other arguments, which will be discussed presently. (b) An argument must first be noticed by means of which he seeks to establish a conclusion which would, I think, take us a distinct step, as regards metaphysical questions, beyond the point at which we were left by the solution of the antinomies of infinity. This is the theory that position in a series is not merely relative, but is absolute also. The argument for absolute position is based upon the principle of abstraction, which we have already met in discussing the definition of number. It will be convenient to state this principle again. Whenever a relation which is both symmetrical and transitive (*i.e.*, which is such that if A has it to B, then B has it to A, and which is such also that if A has it to B and B to C, then A has it to C) holds between two terms, it can be proved that there is some third term to which both have one and the same relation. The relation of simultaneity between events, for instance, is both symmetrical and transitive; and Mr. Russell shews that, if we suppose the fundamental relations of priority, simultaneity and posteriority to hold between events, which will form a series in virtue of

these relations, the principle of abstraction will give us, correlated with the series of events, another series which will be one of times. This proof may seem too abstract to be convincing; but the main point involved is really simple. The advocates of the theory that position in time is merely relative hold that "time" is merely a collective name for an assemblage of relations between events. But to say that two events are simultaneous cannot mean merely that the relation of simultaneity holds between them; for it can be proved that a relation having the properties which simultaneity has is not ultimate, but can be analysed into sameness of relation to some third term. In the case of similarity between classes, this term to which all classes similar to one another must have the same relation, and to which no other terms can have that relation, was, we saw, the number of the similar classes; in the case of quantities, the common property of equal quantities, to which the symmetry and transitivity of the relation of equality points, is a magnitude; and similarly there must, in virtue of the relation of simultaneity between events, be an entity to which simultaneous events, and those events only, have one and the same relation; and this entity is evidently the time at which the events occur. And Mr. Russell thinks that the principle of abstraction will enable us to decide not only that position in time, but that position in space also is absolute and not merely relative. Space, however, presents complications which are absent from time; and he does not explain, as he did in the case of time, in what precise way the principle of abstraction will apply to space. A relational theory of space, he tells us, is one which, while denying spatial position to any entity, should assert that certain relations hold between material points that are themselves non-spatial,—that "space," in short, is merely a collective name for an assemblage of relations between material points. Further, these relations must be understood as involving a reference to time; the relational theory of space will hold that "every

true proposition asserting a spatial relation involves a time at which this relation holds between its terms, so that the simplest spatial propositions assert triangular relations of a time and two terms." Mr. Russell does not explain how the principle of abstraction will help us to decide against this theory. He does not tell us what is the symmetrical and transitive relation holding between two material points from which a third entity—namely, a spatial point—can be inferred, nor does he tell us what the relation is that holds between this spatial point and the two material points; and in the absence of this information I must leave it an open question whether or not the principle of abstraction can turn the scale against the relational theory of space as stated above. The case for absolute motion is clearer. The argument from abstraction, indeed, seems to have no direct bearing on motion; but if it can be decided, whether by means of that argument or otherwise, that position in space and time can not be merely relative, then the view (which is apparently held by some scientists on the ground that relative motion alone is capable of being observed) that all motion must be merely relative will have to be rejected. Finally, Mr. Russell urges that absolute motion is in any case inevitable; it is necessary for dynamics; and it is proved by such instances as Newton's bucket and Foucault's pendulum, which proves the absolute rotation of the earth independently of the fixed stars. And in this fact he sees a confirmation of the theory that position in space and time is not merely relative, but is absolute also.

The principle of abstraction, it should be observed, has thus a twofold importance for metaphysics. In the first place, the theory that position in space and time is merely relative has sometimes been put forward as a reason for denying the reality of space and time. Accordingly, the principle of abstraction, by proving (if Mr. Russell is right) that position in space and time must be absolute, as well as relative, helps, just as the solution of the antinomies of infinity did, to destroy the

reasons on which the view may be based that such things as space and time do not exist. But this negative result does not exhaust the metaphysical significance of the principle of abstraction. For what that principle can prove is, not merely that absolute position is involved in space or in time or in any other particular series that may be supposed to exist, but also the perfectly general proposition that, if anything whatever is a series, then position in that series is absolute and not merely relative. In other words, if the principle of abstraction is valid, it will be true, whether anything exists or not, that if any series exists absolute position is involved. And this is a conclusion which, since series seem to be prominent features of the world of existents, must be admitted to be an important contribution to the general theory of the nature of what exists.

It remains now to consider whether there is any other positive conclusion, of a still greater generality than this, which Mr. Russell's arguments will enable us to draw as to the nature of what exists. I have already suggested that there is one such conclusion, namely, that whatever exists must be either an indivisible term or a whole composed of indivisible terms; and I accordingly propose now to discuss the question whether among Mr. Russell's arguments (even though none may prove conclusively that any particular term or class of indivisible terms exists) there may not be some which can make probable this universal hypothetical proposition about existents. The proof of the proposition in question, if it could be established, would be an achievement of which the philosophical importance could scarcely be overrated. For not only may it be true, even if nothing exists, that if anything exists, then it is either an indivisible term or composed of such terms; but this might be proved independently of any proof or assumption that anything whatever does exist. Consequently, our conclusion might be accepted by philosophers who yet should hold the most widely divergent views as to what things actually do exist; it would only have no great interest for those (if any

there be) who think that nothing whatever exists. Therefore, as in my opinion some of Mr. Russell's arguments perhaps go some way towards making it probable that if anything exists, then it is either an indivisible term or a whole composed of indivisible terms, it will be worth while to examine those arguments, even though we may not succeed in definitely deciding the question. The principal arguments we shall have to examine are those concerned with relations.

II.

Mr. Russell, we have seen, holds that there are such entities as relations, and that relations are indivisible; and for his view that relations are genuine entities he offers various reasons. What I wish to suggest is that the reality and indivisibility of relations will, in the form maintained by Mr. Russell, perhaps require that all entities whatever, that are not themselves indivisible, should be wholes composed of indivisible terms. Our discussion will therefore fall into two parts. I shall first try to give a general view (neglecting particular considerations such as those drawn from the impossibility of giving otherwise a logical account of order) of Mr. Russell's main arguments in support of his doctrine that relations have "absolute metaphysical validity," and I shall next enquire whether this doctrine involves the ultimate indivisibility of all terms, and whether that consequence will follow from any other reasons that he brings forward. If it will follow, it results of course that, since existents are some among terms, whatever exists is either an indivisible term or a whole composed of indivisible terms.

(1) Part of what Mr. Russell wishes to prove, when he contends that relations have "absolute metaphysical validity," is that we must recognise as being distinct entities, each of them different from any other entity that may be among the contents of the universe, a class of entities infinite in number and capable of performing, each of them, that function which

we call "relating" or "holding between." I say "*capable of performing*" in order to bring out the point that it is not necessary to Mr. Russell's view that a relation actually should relate: he sometimes uses the phrase "bare relation," thus implying that terms between which it holds are not necessary to the being of a relation. A further point to be noticed is that it will not be accurate, if Mr. Russell is right, to describe relations, as we might be tempted to do, as those entities which can hold between two or more other entities. For an entity can, he thinks, have a relation to itself. Every entity, for instance, has to itself the relation of identity; and there is thus at least one relation (identity) which has to itself the relation which itself is. But these considerations do not make it difficult to grasp the general meaning of the word "relation." Different though they are, it is plain that such concepts, for instance, as difference, likeness, equality, being greater, being prior, being to the left, are all alike in one respect: they can all relate other entities. The word "relation," in short, covers all the entities, whether named or unnamed, whether well known or generally disregarded, which can hold between any two entities, or—what is the same thing, since any two terms and a relation between them form a complex—between any two parts of any complex whatever. And Mr. Russell points out two connected properties which all relations must have, and which can belong to nothing that is not a relation. A proposition in which a relation holds between two terms may be symbolized by aRb , where R is the relation and a and b are the terms. Then aRb will always (except where a and b are identical) denote a different proposition from bRa . That is to say, it is characteristic of relations that they have *sense*,—that they proceed, as it were, *from* one term *to* the other. Further, whenever R proceeds from a to b , the fact that it does so implies and is implied by the fact that a relation, which may be called the *converse* of R , proceeds from b to a : the presence, *e.g.*, of the relation "father of"

implies and is implied by the presence of its converse, "child of." And these two properties—that of having sense, and that of being equivalent to their converses—can evidently belong to no entities except relations. There are probably other marks by which relations might be distinguished from all other entities; but Mr. Russell does not tell us what these other marks are. He tells us that relations are concepts; but, as we saw, he does not fully explain his distinction between concepts and things; nor does he make it clear in what ways (if any), other than the ways just noticed, relations differ from other concepts. For example, he holds that a relation does not have "instances," but is one and the same in all propositions in which it occurs; *i.e.*, when A differs from B and C from D, it is not one specific difference (that between A and B) which occurs in the first proposition, and another difference (that between C and D) which occurs in the second proposition; one and the same difference occurs in both. But whether this characteristic is shared by relations with other concepts; whether no concepts have "instances," or whether some do and some do not; this is a question that he does not discuss. And it might be doubted whether he is correct in saying that every relation is unique. His argument to that effect (p. 52) really only shows, I think, that there must be *some* relation which is one and the same in all cases of its occurrence. Again, it does not seem certain that there can not be two spatial relations exactly like one another; though this doubt would be ruled out both by Mr. Russell's view that all relations are concepts and that no two concepts can differ merely numerically, and by his view that no two entities whatever can differ merely numerically. It might, however, be thought that he does indicate a point of difference between relations and concepts in general in the passage, mentioned above, where he says that relations are not conceivably divisible; for he certainly holds that some concepts (for instance, what he calls "propositional concepts") are complex. But it is difficult to see what characteristic of relations

he has in mind when he says that they must be indivisible. He seems to hold that some relations are complex, since he speaks of some relations (*e.g.*, quantitative equality) as being "analysable"; and he tells us that the logical product of two or more relations is a relation. When, therefore, he says that relations are not divisible, he evidently does not mean that they must be simple in the sense of non-complex; and, since he sometimes uses the words "simple" and "indivisible" as synonymous, we are thus left in doubt as to how the universal indivisibility of relations can be compatible with their occasional complexity. But, whatever the solution of these difficulties may be, what he means by maintaining the metaphysical validity of relations is thus far clear: there must be these entities that hold between terms. And this conclusion he enforces in several ways. In the first place, there is the cumulative impression we receive from finding, as his work advances, that the recognition of relations as genuine entities is necessary for the theory of mathematics. Then again he argues, as we shall see, that there must be relations, because to deny them leads to self-contradictory consequences. And finally he suggests that the view that there are no such entities owes its plausibility to a logical doctrine which, though widely held, must be rejected—the doctrine, namely, that all propositions ascribe a predicate to a subject.

But in maintaining that relations have absolute metaphysical validity, Mr. Russell means, I think, to assert something more than merely that there are relations. Not only must it be admitted that there are relations, but he holds that all relations are purely external; and he seems to imply that there is some necessary connexion between these two positions. The doctrine that relations are external may be held in more than one form; but throughout this book the form of it which he has in mind seems to be that according to which it is always false to suppose that any relation is a part of the terms which it relates. This he sometimes expresses

by saying that relations do not "modify" their terms: every entity is eternally what it is, and to say of a term that it is modified does not mean that its internal nature is changed by the fact of its being related to some other term, but rather that at one time it has a relation which it does not have at another. And just as, according to Mr. Russell, the common philosophical prejudice against recognising relations at all is largely due to the traditional logical doctrine which interprets all propositions as ascribing a predicate to a subject; so again it is this same doctrine that helps to make plausible the supposition that relations can not be external—a supposition which in its turn makes it plausible to suppose that there are no such entities as relations. And the connexion between the traditional subject-predicate logic and the view that all relations are parts of related terms may be roughly stated as follows. If we hold that all propositions ascribe predicates to a subject, we shall tend to describe the combination of a subject with its predicate as being in the nature of an "organic unity"; by which phrase will be meant (among other things) that the whole thus formed is a whole such that the nature of its parts is determined by the fact that they are parts of the whole in question. The parts, it is thought, would not be the terms that they are apart from their combination in the whole, and the whole is therefore incapable of analysis, in the sense that to distinguish parts by isolating one from another must always be fallacious; for any part, when considered separately, is no longer the part which it was in combination. In other words, analytic judgments are fundamental, and to deny any true proposition is self-contradictory; for all true propositions express the intrinsic nature of some logical subject. Consequently, since to analyse must always be to falsify, the recognition of relations as something completely distinct from the terms which they relate can never be valid. Of the arguments which may be used to support this general position, the most important noticed by Mr. Russell are (*a*) the view that

all truths have an essential reference to what exists, and (b) the doctrine that analysis is falsification. Something must be said as to his treatment of each of these.

(a) That all true propositions are, in some sense, concerned with facts is evident; and, since the words "fact" and "reality" are often used as synonyms, it seems equally evident that all truths are concerned with reality. Mr. Russell, however, points out in effect that the word "reality" is ambiguous. When I say that $2+2$ "really" is equal to 4, or that the fact that they make 4 is a "reality," I am using the word "real" in a different sense from that in which I say that this sheet of paper is "real" or is a "reality." For naïf thought truths about things which can be seen and touched—things, that is to say, which have the kind of reality possessed by this paper—are the most common, the most vividly realized, and hence the most obviously certain sort of truths. Now truths of this sort are generally expressed in a form which may be regarded as ascribing an attribute, predicate, quality or property to some subject: *e.g.*, "This paper is white"; so that those philosophers who try to reduce all truths to this form are only following a natural tendency of naïf thought. The essential moment in this tendency seems to be the view that there is always some "real" subject or substance, whereas the predicate or attribute is not "real" at all, or only to be regarded as "real" in virtue of its combination with its subject or substance. But if we distinguish two senses of the word "real," this view ceases to be plausible. The phrase "a reality" may be confined to what exists; and if so, then what can not exist by itself—*e.g.*, such a concept as goodness or as the number 2—will in that sense not be real, though it will still be real in the sense of being something. And if the "abstract notions" that seem to occur in some propositions are "real" in this sense of being definite entities, although incapable of existence, there seems to be no reason for denying that some truths are concerned exclusively with

those notions, and not at all with anything that exists. Thus the distinction between the two senses of "real,"—between, that is to say, terms that "exist" and terms that only "subsist" or have "being"—is fatal to the view that all truths refer to existence. Moreover, it tends to rob the subject-predicate logic of some of its plausibility; for, if we agree that what does not exist is nevertheless a genuine entity, we shall incline to regard propositions as being concerned with the relations that hold between entities irrespective of existence, rather than as ascribing some predicate to a subject that exists. That there is this distinction between existence and being can not perhaps be strictly proved. Mr. Russell, indeed, thinks that a reason in its favour is provided by the fact that to neglect it (as the subject-predicate logic will tend to do) leads directly to monism, which, he urges, is self-contradictory—an argument which will be noticed presently. But the distinction is so fundamental that it will always be possible to hold that any argument for it involves a *petitio principii*; as, for instance, might be held with Mr. Russell's argument that existential propositions presuppose those asserting the being of terms. Existence, he points out, does not exist. But to say that existence does not exist cannot mean that it is nothing (as must be meant if there were no difference between existence and being), because, if it were nothing, it could not be significantly ascribed to anything. In fact, a proposition asserting mere being—namely, "Existence is"—must be true if any proposition of the form "this exists" is to have meaning. Again, in order to the significant denial of the existence of any term, the term in question must be; for if it were nothing, nothing could be said about it: if Jupiter had not being, "Jupiter does not exist" would be an empty sound. Special difficulties, however, are connected with this last argument. If it is sound, there must be such entities as round squares in order that it may be true (as it seems to be) that round squares do not exist. But it is, I think, doubtful whether a round

square is a genuine entity,—a doubt which suggests that Mr. Russell's statement that *everything* that can be mentioned has being needs some qualification. In any case such arguments amount to little more than saying that the consideration of existence itself puts the difference between it and being in a particularly clear light.

(b) This difference, then, since it shows that some terms that do not exist must be genuine entities, might seem by itself a sufficient ground for rejecting any explanation of relations as mere adjectives or parts of terms. It strongly suggests that propositions can be validly analysed into terms and the relations between them. But this view has, we saw (p. 139), special difficulties when we apply it to subject-predicate propositions; moreover, there has to be set against it the general difficulty expressed in the dictum "Analysis is falsification." Mr. Russell admits there is some truth in this dictum, but only in a certain restricted sense. If it be meant that a whole may be conceived as analysable, although it is indivisible in reality, this is certainly false. For if anything is really indivisible, it is not a whole but a unit; if it is a whole, it has parts which it cannot be a mere fiction to distinguish from each other and from the whole. On the other hand it seems to be true, as Mr. Russell points out, that no whole is the same entity as all its parts. A whole is a new single term, distinct from each of its parts and from all of them; it is related to the parts, but has a being distinct from theirs. And this fact gives us the only sense in which it is true that analysis is falsification: to analyse a whole into its parts is always to "falsify," simply in the sense that analysis must destroy the particular term which the whole is. At first sight indeed it might seem unnecessary to distinguish thus between the whole itself and all its parts in the case of one kind of wholes,—those, namely, of the kind which Mr. Russell calls aggregates, and which he sometimes describes as being constituted by the combination of parts in

the way indicated by the word "and." All classes are wholes of this kind; and the distinction, which he often uses, between a class "as one" and a class "as many" is parallel to (if it is not identical with) the distinction between an aggregate and all its parts. The peculiarity of such wholes is that, as soon as all the parts are known, the whole is completely known. But, although the specification of the parts of an aggregate is thus equivalent to the specification of the whole, there are overwhelming reasons why we yet should admit the aggregate itself to be different from all its parts. And, if so, a true meaning can, as just explained, be found for the dictum that to analyse a whole is to falsify it. Further, in the case of wholes of another kind which, to distinguish them from aggregates, Mr. Russell calls unities, the fact that the whole is a separate term, which is lost in analysis, is much easier to perceive. Unities are wholes of the kind that propositions seem to be; and the fact that a whole is a new term, distinct from all its parts, is peculiarly evident in the case of propositions, because a proposition is never even equivalent to the sum of its parts. "A is greater than B," for instance, seems to contain as parts only A and B and the relation "greater than." But it is plain that the mention of those parts is not equivalent to the mention of the whole: "A and 'greater than' and B" is a list of terms and not a proposition; and moreover there is a different whole, namely, "B is greater than A," composed of precisely the same parts as our first whole. A whole, then, whether an aggregate or a unity, is always a new single term, different from its parts as many. But it is plain that this fact will not allow us to conclude that the parts of a whole are not really its parts, nor, in particular, that relations are not really parts of propositions but must be explained away as states of terms.

There is, however, a further argument (it is used by Mr. Bradley) which professes to show that at least one of the constituents of a unity always evades analysis. A relation

considered as actually relating its terms can not, it may be said, be the same as that relation considered by itself. For to say that a relation actually relates is to say that it has certain relations to its terms, and that these relations in turn have further relations to the original relation and to the terms, and so on *ad infinitum*; so that analysis, if its object be to specify the entity that actually relates the terms, breaks down, as it is impossible to enumerate an infinite number of entities. Mr. Russell replies to this by admitting the infinite regress: the holding of a relation does, he thinks, imply the holding of an infinite number of other relations in the way just described; but he urges that the infinite regress is logically unobjectionable. For there are two kinds of infinite regress, one vicious and the other harmless. The vicious kind occurs whenever it is attempted to explain the meaning of a proposition by means of analysis, and an infinite number of steps has to be taken before a definite meaning is reached. This kind is illustrated by circular definitions; but no circularity is present in the case of a relation holding between two terms. In this case a proposition with a definite meaning, such as "A is different from B," implies two other propositions, viz., "A has a certain relation to difference," and "Difference has a certain relation to B"; and these in turn imply other propositions, and so on *ad infinitum*. But these propositions, though all implied by the original proposition, form no part of its meaning, and consequently the infinite process raises no logical difficulty. In other words, the fact (if it be a fact) that the truth of any one relational proposition implies the truth of an infinite number of other relational propositions does not show that the relation which we mean, when we assert a relational proposition, is not a single definite entity. That the infinite process raises some difficulty, Mr. Russell would not indeed deny. That no relation should be able actually to relate two terms without the holding of an infinite number of other relations seems a strange state of things; and it is partly this difficulty

that he intends to turn by a view which he suggests in several places, and which is, I think, untenable in the development he gives to it,—the view, namely, that verbs “embody the unity” of propositions. Verbs, that is to say, express relations as actually relating, whereas verbal nouns indicate “bare relations.” Thus he would say that “the difference between A and B” is the bare relation, and that “A differs from B” is a proposition in which difference is a constituent that actually relates the terms;* and he suggests that it is the element of assertion, present in the proposition and absent from “the difference between A and B,” which constitutes the distinction between an actually relating relation and a relation by itself. But “the difference between A and B,” in whatever respect it may differ from the corresponding proposition, certainly resembles that proposition in being a complex and in containing the relation as a constituent: the relation evidently relates A and B (when A does differ from B) just as much in the unasserted as it does in the asserted proposition. This indicates that we can not make the mere assertion of a proposition responsible for its unity, and consequently the difficulty raised by the infinite process remains. But, whatever its true solution, this difficulty does not, as far as I can see, give any reason for thinking that relations are not genuine parts of propositions. The fact (if it be a fact) that the difference between two terms is a complex containing an infinite number of parts does not entitle us to hold that any one of those parts is not the entity which it is irrespective of its inclusion in the whole. I do not, in short, see that the infinite regress of relations justifies any explanation of relations as states of terms. We have seen how Mr. Russell damages that view by emphasising and explaining the distinction between being and existence. His main case against the traditional logic may now be briefly stated.

* This distinction is suggested on pp. 52, 100. It is, however, denied on p. 139.

The attempt to deny that relations are genuine entities falls, roughly speaking, into two stages, of which the first may be called the monadistic, and the second the monistic. Those who wish, with Leibniz, to preserve a plurality will analyse every proposition which seems to assert a relation of two terms into two propositions, one ascribing a predicate to one term, and the other ascribing a predicate to the other. Thus, "A is greater than B," will give (1) a proposition ascribing a predicate to A ("greater than B"), and (2) a proposition ascribing a predicate to B ("less than A"). Mr. Russell founds an argument against this view on the fact that where the relation is asymmetrical it is necessary that the two predicates should be different, and that this necessity gives rise to an infinite process of the vicious kind. But he also urges that the suggested analysis is untenable, whatever the relation may be. We cannot define the assertion of a relation between A and B as meaning that A has an internal state, and that B has an internal state, because the truth of these assertions presupposes the holding of at least the relation of difference between A and B: unless A and B are already two, it cannot be true either that they have the same internal state, or that they have different internal states. Since, then, the theory that the essence of relations is to be found in the internal states of terms is inconsistent with a plurality of terms, we shall, if we wish to save that theory, tend with Spinoza and Mr. Bradley to give up the plurality and to hold that there is only one subject, God or the Absolute, and only one type of proposition, namely that ascribing predicates to the Absolute,—a view which, since the Absolute exists, and is the only reality, harmonises with the theory that all truth essentially refers to existence. To this Mr. Russell's reply is that, if the Absolute really has or is qualified by its predicates, its predicates can not be nothing. Thus the subject-predicate proposition, which was supposed to be ultimate, really presupposes a proposition asserting the being of the predicate; also it presupposes propositions asserting

relations,—namely, that the subject is different from the predicate, and that the predicate has the relation of predication to the subject. The attempt to deny the independence of relations, which broke down at the monadistic stage, thus fails again at the monistic stage.

(2) Such is the general line of argument by which Mr. Russell seeks to show that relations must be accepted as ultimate and can not be defined as consisting in the internal states of terms. And not only must it be admitted that relations have being, but they must be external to their terms: there is not, that is to say, for every true proposition asserting a relation, a corresponding true proposition asserting an internal state of some subject. I have stated these arguments crudely, but I hope in such a way as to indicate their force. They have never, so far as I know, been fully met. Our question now is, Does the recognition of relations as genuine entities necessarily involve the ultimate indivisibility of all terms? Or, more exactly, does it imply that every term is either indivisible or a whole composed of indivisible terms? By proving that relations have “absolute metaphysical validity” we have refuted both the view that the universe is a plurality of entities with different internal states or qualities, and the view that it is a single entity qualified in various ways. For these views we have substituted, since relations are ultimate and since to say of anything that it is “qualified” will be to say that it has a relation to another term, the notion of a universe of entities and the relations which they have to one another. Every term is what it is, and has the relations which it has. It is, perhaps, natural to conclude that every term which is not itself indivisible must be composed of indivisible terms. For if a term is not an indivisible unit, it must be a whole; and being a whole it will, we have seen, be validly analysable. Then at first sight only two cases seem possible. It may be a collection of the kind formed by the adding together of terms (an aggregate); in which case it is plausible to suppose that there must ultimately *be* indivisible

terms to be added together in order that the whole may have being. Or it may be a whole of the kind formed by the holding of a relation between terms (a unity); and in that case we might be tempted to think that its constituents,* if they are not simple themselves, must either be aggregates (to which the preceding argument will apply) or else must be unities which at some stage of their analysis must be composed of simple constituents. But before we accept this conclusion it will be well to try to make it more precise; and I know of no better means to this end than to state the main results of the discussion which, in Chapters xvi and xvii of his book, Mr. Russell devotes to the difficult questions of the meaning of whole and part and the nature of infinite wholes.

It is plain that our question is identical with the problem as to the nature of infinite wholes; for if a whole has a finite number of parts, either all its parts are indivisible, or at least one of them is a whole containing among its parts at least one which is divisible; and so on *ad infinitum*. What we have to ask, therefore, is, Must every infinite whole be composed of indivisible parts? And, to begin with, Mr. Russell thinks that there certainly are some infinite aggregates composed of indivisible terms. He instances the sum-total of all colours and the stretch of fractions from 0 to 1. The view that aggregates such as these are composed of indivisible terms, infinite in number, can no longer be rejected on the ground that it is self-contradictory; and moreover there are, he thinks, special reasons in some cases for admitting infinite aggregates of indivisible terms. But even if some such aggregates must be admitted, it will not follow that every infinite whole must be of this nature; and Mr. Russell describes, as being abstractly possible, two kinds of infinite wholes which may contain no indivisible parts. These are derived

* Following Mr. Russell, I use "a constituent" as = "a part of a unity."

from the consideration of aggregates and unities respectively. The abstract possibility of an infinite unity need not, however, detain us long. An infinite unity is defined by Mr. Russell as one of which it is not true that the aggregate of its simple constituents is finite; and he points out two main ways in which, consistently with this definition, a unity may be infinite: among its constituents there may be some simple ones, but these must be infinite in number; or there may be no simple constituents at all. But the second of these cases is surely not possible; for relations are among the constituents of all unities, and relations are *ex hypothesi* indivisible. And as to the first case, I think it doubtful whether it really reveals any different problem from that (to be noticed immediately) raised by the possibility of an aggregate containing no indivisible parts. Be that as it may, an infinite unity could, as Mr. Russell observes, never be known, since it is impossible to know a proposition composed of an infinite number of constituents. (Thanks to its capacity for being denoted by a single concept, an infinite aggregate,—*e.g.*, all the cardinal numbers,—may be a constituent of a proposition of finite complexity.) I pass, then, to the other kind of infinite whole, which, Mr. Russell seems to think, possibly may contain no indivisible parts. In discussing the nature of aggregates he distinguishes, I think, three main senses in which things may be said to be parts of wholes,—though what he says as to the third of these senses is rather obscure, and it is possible that I have mistaken his meaning. (1) There is first the sense in which, whenever we have a collection of many terms and the collection composes an aggregate, each of the single terms of the collection is a part of the whole. But (2), in addition to the relation of whole to part which holds between the aggregate and each of the single terms composing it, there is another relation, also deserving to be called a relation of whole and part, which holds between our aggregate and any aggregate composed of some but not all the terms of our aggregate. And these two relations are not identical; the relation of Socrates to the human

race is a different relation from that of the Greek nation to the human race. Mr. Russell shews, however, that the second of these relations can be defined in terms of the first, and that therefore it does not yield any new indefinable sense of "part." If, then, apart from unities, nothing can be a whole, except in the sense of being an aggregate, nothing can be a part, except in the senses of being either (1) one of the single terms of an aggregate or (2) a term which is an aggregate of some of those single terms. And it is clear that, corresponding to each of these senses of "part," is a sense in which an aggregate may be said to be infinite: when we call an aggregate infinite we may mean that it contains an infinite number of parts either in sense (1) or in sense (2). Further, whatever is an infinite aggregate in sense (1) may also (perhaps it must) be an infinite aggregate in sense (2): a space, for instance, is an aggregate of an infinite number of points, and is also an aggregate of an infinite number of infinite aggregates of points. But (3) Mr. Russell goes on to suggest that perhaps aggregates are not (apart from unities) the only kind of whole after all—that there is, perhaps, in addition to the above two senses, a third and indefinable sense in which a term may be said to be a part of a whole. His argument seems to be that some terms, which are parts in the second of the above senses, may *also* be parts in this new sense. We might, for instance (if I understand him aright), mean, when we say that Australia is part of the earth, not merely that it is an aggregate of some but not all the terms of an aggregate (the material points composing the earth, for instance); we may indeed mean this, but we may also mean that it is a *part*, in some new and indefinable sense, of some whole which, though it may be an aggregate, is also a *whole* in some new and indefinable sense. And it is this possibility which, if we are to conclude that *all* infinite wholes must be composed of indivisible parts, makes it necessary to look for some general reason for that conclusion, apart from such as may be drawn from the consideration of infinite aggregates;

for, although it may be the case that everything which is a whole in the third sense is also an aggregate, it would be difficult to prove that this must be so; moreover, the reasons for supposing that all infinite aggregates must be composed of indivisible terms are not, as we have seen, as conclusive as might be wished. Mr. Russell thinks, indeed, that no good reasons have ever been given for supposing, as to any particular infinite whole, that it contains no indivisible parts, and that there are some infinite wholes which it is more in accordance both with common sense and with science to suppose composed of indivisible parts; but there remains, as just explained, the abstract possibility that there may be some infinite wholes of which this is not true. Against this possibility he puts forward, but only tentatively, the following argument, based on the connection between whole and part and logical priority. "The simpler," he says, "is always implied in the more complex, and therefore there can be no truth about the more complex unless there is truth about the simpler. Thus, in the analysis of our infinite whole we are always dealing with entities which would not be at all unless their constituents were. . . . It seems to follow that infinite wholes would not have Being at all, unless there were innumerable simple Beings whose being was pre-supposed in that of the infinite wholes" (pp. 147, 148). How much force should be allowed to this argument is a question which could only be decided after further investigation of the difficulties connected with the relation of whole and part, and after a thorough discussion of the nature of logical priority—both tasks which whoever undertakes must do so with a profound sense of obligation to Mr. Russell.

Meanwhile I must end by leaving our main question in suspense. In Part I, I tried to explain Mr. Russell's proof that infinity is possible. It follows from that proof that no argument drawn from the supposed contradictions of infinity has by itself any force against the supposition that actual space

and time, for instance, are collections of an infinite number of indivisible terms. Mr. Russell, it is true, does not prove, and need not, for his mathematical purposes, assume, that anything exists. But I suggested that his arguments might perhaps support the conclusion that if anything exists it is either an indivisible term or a whole composed of indivisible terms. In Part II his main arguments for the recognition of relations as genuine entities were set forth. The validity of relations does, I think, point to the universality of indivisible terms ; and if every term, which is not itself indivisible, must be composed of such terms, the desired conclusion as to existents (if there are any) will follow. But our examination of the relation of whole and part revealed the abstract possibility of a whole composed of an infinite number of parts, no one of which is indivisible.

VIII.—ON MR. S. WATERLOW'S PAPER.

By SHADWORTH H. HODGSON.

WHEN a logician or a mathematician brings forward a philosophy of Logic, or of Mathematic, or seeks to show—the one that Philosophy is Logic, the other that Mathematic is Logic,—I seem to hear them both alike pleading as advocates before the tribunal of Philosophy, and why? Because Philosophy is the only branch of Knowledge which has nothing but Knowledge itself in the widest sense as its object-matter of enquiry, nothing but the discovery of Fact as its purpose, no *special* object-matter, and consequently no special intellectual discipline or doctrine to justify or recommend. I seem to hear the advocates of any such *special* branch of Knowledge saying :

“ Laugh (in our sleeve of course) where we must ; be candid where we can,

But vindicate the ways of (Logic or Mathematic, as the case may be) to man.”

But why do I make these remarks ? It is because I think we are in danger of forgetting that Philosophy takes Knowledge in the widest sense as its object-matter of enquiry, and that this enquiry is that which alone justifies the existence of this, the Aristotelian, Society ; and moreover, that Philosophy has a definite character and history of its own, a history dating—in our Western world at least—from Parmenides, Socrates, and Plato, and plainly marking it out from any of its own dependent parts, such as Logic, as well as from any positive physical or psychological Science.

The forgetfulness or neglect of these facts—those, I mean, of the nature and purpose of Philosophy, and of its history and development as the pursuit of that purpose—leads to the basing of all the sciences generally called mental or moral upon *concepts* which *thinking* introduces into experience, instead of

basing them, ultimately, upon the experience which concepts themselves pre-suppose. Endless and fruitless logomachies may be expected to follow from such a method. But on this, of course, I cannot now enlarge.

But here I must say, that I know not whether or not Mr. Waterlow, the reader of the present paper, is to be classed among those logicians who hold, or who would, on occasion arising, seek to show, that Philosophy is Logic. It may be that it is only in the present paper that he adopts the method of arguing on the basis of concepts, in order to meet Mr. Russell on his own ground. At any rate, in the concluding sentence of his paper he reminds us that he has proved the "abstract possibility of a whole composed of an infinite number of parts, no one of which is indivisible"; which is like a crumb of comfort let fall from his table for the behoof of the humble experientialist, to whom it seems obvious that, so long as we take anything whatever to be perceivable, we *ipso facto* suppose it to be divisible *by thought*.

IX.—ARE SECONDARY QUALITIES INDEPENDENT OF PERCEPTION?

A Discussion opened by T. PERCY NUNN and F. C. S. SCHILLER.

I. By T. PERCY NUNN.

It is important to make as clear as possible the sense in which I give an affirmative answer to this question. I will, therefore, begin by contrasting with certain well-known views the view which I wish to defend.

(a) The first of these is the Lockean view, which not only has great historical importance, but is still the creed of the average physicist and physiologist. It has its most condensed and vigorous expression in the following passage of the *Essay*: "The particular bulk, number, figure, and motion of the parts of fire or snow are really in them, whether any one's senses perceive them or no; and therefore they may be called *real* qualities, because they really exist in those bodies. But light, heat, whiteness, or coldness, are no more really in them than sickness or pain in manna. Take away the sensation of them; let not the eyes see light or colours, nor the ears hear sounds; let the palate not taste, nor the nose smell; and all colours, tastes, odours, and sounds, as they are such particular ideas, vanish and cease, and are reduced to their causes, *i.e.*, bulk, figure, and motion of parts." To which pronouncement it must be added that "the ideas of primary qualities of bodies are resemblances of them, and their patterns do really exist in the bodies themselves; but the ideas produced in us by these secondary qualities have no resemblance of them at all."

(b) The next is the Berkeleian view that "those arguments which are thought manifestly to prove that colours and tastes exist only in the mind . . . may with equal force be brought to prove the same thing of extension, figure, and motion"; and

that "the absolute existence of unthinking things without any relation to their being perceived . . . is . . . perfectly unintelligible. Their *esse* is *percipi*, nor is it possible that they should have any existence out of the mind or thinking things which perceive them."

(c) The third is the view which may be collected from two valuable papers for which this Society is indebted to Professor Stout.* Mr. Stout accepts Berkeley's contention that our "simple ideas" of primary and secondary qualities are psychical existents and as such have exactly the same status; but he also agrees with Locke in holding that they have a relation to extra-mental realities. These extra-mental or "physical" existents include the secondary equally with the primary attributes of matter, which are in each case "correlated but not identical with intrinsic characters of sensation." "The correlation is essentially of the same kind for both. Sensation enters into the constitution of the . . . attributes only in so far as certain features of sense-experience represent something other than themselves, and it is only because this representative function is logically independent of the actual occurrence and fluctuation of sense-affections that the primary qualities can be validly thought of as existing in the absence of percipients. We are justified in thinking of matter as extended and movable in space before the existence of sentient being. But we have exactly the same justification for thinking of it as hot or coloured. Finally, the positive and specific nature of the primary qualities no less than that of the secondary is derived from corresponding sensations."† There is, however, a real and important difference between the two kinds of attributes: "The executive order of the material world can be expressed only in terms of the primary and not in terms of the secondary qualities of matter. . . . The system of

* *Proceedings of the Aristotelian Society*, 1903-4 and 1908-9. They will be quoted as "first paper" and "second paper" respectively.

† First paper, p. 147.

uniformities of co-existence and sequence and of quantitative equivalences and correspondences which constitutes the order of physical nature in its causal aspect can be formulated only in terms of extension, motion, and tension." *

As against these views I propose to maintain (1) that both primary and secondary qualities of material bodies "are really in them, whether any one's senses perceive them or no"; (2) that they exist as they are perceived; by which I mean that although (in Mr. Bradley's phrase) "the qualities impart themselves never except under conditions," yet these conditions do not affect the character of the qualities perceived; and (3) that sensations as mental entities exercising a "representative function" need not, therefore, be postulated.†

The Arguments for the Psychical Nature of Sensations.

The assumption of mental or psychical existents (as distinguished from the psychical processes whose occurrence constitutes a cognition) is the fundamentally important element in each of the doctrines which I have quoted. It will be well, therefore, to examine briefly the chief grounds for this assumption. They are to be found expressed most clearly in Mr. Stout's papers.

The first and most inclusive ground is that there are (apart from conation, attention, etc.) elements in experience whose being consists "only in being experienced."‡ A tooth-

* First paper, p. 153.

† In two notable Presidential Addresses Professor Alexander has lent his great ability and prestige to the defence of these same positions. Some of the following arguments can hardly fail to recall those which he has used with so much effect. For this reason it may be advisable to point out that I have an independent right to use them. They will be found to be either abstracts or obvious extensions of arguments brought forward in papers which I read to this Society in 1906 and 1908, and in a book (now out of print) on the *Aims of Scientific Method* (1907), all written before I was aware that Mr. Alexander was a supporter of similar views.

‡ Second paper, pp. 231-6.

ache is regarded by Mr. Stout as so obviously a case of this kind that it is sufficient merely to call attention to it. "If our existence as conscious beings were annihilated it would *eo ipso* disappear, whatever might happen to our body." Dream apparitions and hallucinations are almost equally easily disposed of. "Their beginning to appear to [the subject] and ceasing to appear to him are the beginning and cessation of their existence. If he were annihilated they would *eo ipso* be annihilated." Such cases as the yellowness of buttercups or the greenness of grass are less obvious and demand argument. The proof that here also we are concerned with elements that exist only in being experienced is (in brief) that "the immediately experienced quality may vary when things seen remain unaltered." For example, I do not impute to the buttercup the changes produced by contrast of colours or by the oncoming of twilight.

In this first group of cases, the elements of experience under consideration "belong to the objective rather than the subjective side of the subject-object relation,"* and, as we have seen, the proof that they are psychical lies in the supposed fact that they "exist only in being experienced." In another group of cases Mr. Stout bids us observe that sensations "are capable of being mentally presented without being objects at all."† Thus I may be "quite inattentive to words as articulate sounds . . . [and] attend only to the meaning they convey." Or the "sympathetic excitement" involving a whole complex of sensations of which he is "entirely heedless" may yet be the means by which the spectator of a football match enters into the experience of the players. "Sensations, then, may be in the proper sense *subjective*." On the other hand, pleasure and pain, which are normally subjective, may, on occasion, be objective. Thus Ferdinand experienced (subjectively) delight

* Second paper, p. 231.

† Second paper, pp. 243-6.

in the (objective) painfulness of carrying logs in the service of Miranda. Painfulness and sensations of sound, pressure, etc., may, then, alike appear either on the subjective or the objective side of the subject-object relation. We must assign them, therefore, to the same ontological status. "But no one . . . will maintain that pain is ever . . . anything but a mental fact." It follows that sensations are mental facts also.

A discussion of these arguments will be the best introduction to an alternative doctrine. They all appear to involve the same major premise: "Anything which exists only in being experienced must be psychical." It is true that in the second argument we are not told why nobody would maintain pain to be anything but a mental fact, but there seems to be no reason available except that its existence is dependent upon its being experienced. For Mr. Stout admits that a thing need not be psychical simply because it is not physical, and the form of his argument shows that he cannot here mean to maintain that a thing must be psychical if it can once be found on the subjective side of the subject-object relation. If, then, for the sake of argument, we grant this major premise, everything turns upon the truth of the minor premise: "Pain, sensations of colour, etc., exist only in being experienced."

It has already been noted that Mr. Stout offers no evidence for this statement in the case of pain. Yet to me, at any rate, it is by no means self-evident, and there seem to be considerations to urge against it. In the first place the painfulness of a toothache may present itself as a thing *to be reckoned with* as much as St. Paul's Cathedral, although my experience of it, like my experience of St. Paul's, may be transferred to the subject side of the subject-object relation if (for example) my interest is engrossed by the utterances of an eloquent preacher in the pulpit. It seems as fair to deduce from this that the pain is, like St. Paul's, something outside my mind, with which my mind may come into various relations, as it is to deduce that the sensations due to the presence of St. Paul's have, like the pain,

merely a fleeting psychical existence. Again, experience of the toothache and of the cathedral depend in each case upon the fulfilment of certain physical conditions, and I am no more bound to suppose that the pain is snuffed out of being when I cease to feel it than I am to suppose that St. Paul's is annihilated when I cease to see it. Indeed, there are occasions when the presence of the appropriate physical conditions gives me a positive reason for supposing that the toothache was "there all the time" though I did not feel it. When these physical conditions are, after an interval, restored, the "same pain" returns. On comparing notes with an acquaintance in whose body the same physical conditions exist, I find reason to believe that we both suffer the "same pain." It is conceivable that the pains in these cases are the "same" in a sense identical with the sense in which one person at two different times, or two different persons at the same time may be seeing the "same" cathedral. The pain may from time to time be drawn into individual experience from the kind of "cosmic reservoir" that has been suggested* as a possible source of the abnormal knowledge present to the trance-consciousness of Mrs. Piper. Hallucinations of pain—that is, experiences of a certain pain in the absence of the lesion which normally conditions them—could, on such a hypothesis, be explained, like telepathy and the other forms of telæsthesia that are believed to occur, as direct experiences of the object unmediated by the ordinary physical machinery. This explanation is easier than one which assumes a pain to be a psychical element normally called into existence only by the existence of certain physical conditions.

I can see only one positive argument against the continued being of a pain outside experience. It might be contended that the pain of a toothache and sensations of colour and extension are of the same order of existence; that the latter are psychical because they are merely fleeting "representatives" of abiding

* By Professor James, *Proc. S.P.R.*, LVIII, p. 4.

physical realities like St. Paul's Cathedral ; and that the former must, therefore, be a fleeting psychical existent. It is obvious that this argument would have no cogency for one who did not accept Mr. Stout's view of the representative function of sensations. Moreover, it would from any point of view destroy the force of the contention that sensations of colour, extension, etc., must be psychical existents because they are on the same footing as pains which are undoubtedly psychical. The argument cannot be worked both ways at once.

It would be impertinent to suggest that Mr. Stout's thought has followed this circular course. But in the absence of any reasoned support of the statement that pains exist only in being experienced I feel that the case of the "presentations of special sense" is the keystone of the deductive bridge over which Mr. Stout would lead us to the recognition of these psychical existents. His argument here is, as we have already noted, a modification of the one used by Locke to prove that secondary qualities are psychical and by Berkeley to prove that both primary and secondary qualities are purely psychical. A hot body yields different sensations of hotness at different distances ; a buttercup gives different colour sensations when viewed by the margin of the retina instead of by the centre, or by twilight instead of by full daylight. But these differences do not imply changes in the hot body or in the buttercup. The sensations must, therefore, be psychical entities which exist only in being experienced.

The validity of this conclusion obviously rests upon the truth of a definite assumption : that the hot body cannot at the same time own all the hotnesses that can be experienced around it, nor the buttercup at different times the various colour qualities that may be "existentially present to consciousness when some one observes it." Of this proposition, as of the proposition that pains exist only in being experienced, I venture to say that it is not self-evident, that certain considerations weigh against it, and that Mr. Stout has adduced no counterbalancing

considerations in its favour. Upon Mr. Stout's theory there are extra-mental qualities of the buttercup "correlated but not identical with" the various sensations. These sensations, each under a specific set of conditions of perception, "represent, express, or stand for something other than themselves"* which is the actual extra-mental secondary quality of temperature or colour. Mr. Stout is emphatic that in exercising their representative function the sensations really mediate knowledge of the extra-mental realities. The plain man "is convinced and rightly convinced that these objects are physical not mental."† But when we inquire into the nature of the qualities which the sensations represent and the grounds for the conviction that they are physical Mr. Stout's reply is disappointing. It would seem that the reason why I say that I see a yellow buttercup when as a matter of fact the quality immediately presented is not yellow is that this quality represents to me the quality that would be presented under certain normal or standard conditions of perception. But, unless this normal presentation is identical with the physical secondary quality, how can it be said that the latter is "represented" by the actually occurring quality? For if one thing is to stand for or to represent another we must have direct knowledge both of the thing represented and of the symbol. But we are told that "what we call the colour of the external thing cannot be simply identified with any quality which is existentially present to consciousness when someone looks at it."‡ It is true that we are also told, both of primary and of secondary qualities, that they are "derived" from the corresponding sensations; but, in face of the statement quoted in the last sentence, this "derivation" cannot mean such a relation between the physical attribute and a sensation that to have the latter immediately present to consciousness is *ipso facto* to know the former. One is bound to conclude that the only

* First paper, p. 144.

† Second paper, p. 229.

‡ Second paper, p. 232.

representation which Mr. Stout has exhibited to us is the mutual representation of sensations. Any one of these may not only be itself experienced but in that experience may stand for, express or represent a definite series of others. But if at the same time we hold that a given sensation by this representation mediates knowledge of an extra-mental thing then it seems impossible to avoid identifying with this thing at least one member of the series for which the given sensation stands. That is, there is in each of these series at least one member that cannot be thought of as a fleeting psychical existent. Since there is no evidence to attach this prerogative to one rather than to another of the series it is safest to identify the physical attribute with the whole of them.

Same as
Wilson.

Origin of the Belief in Psychical Sensations.

It is not difficult to point to motives that have done much to secure for the belief in the psychical nature of sensations the position of an orthodoxy. The first is the motive of "economy of thought." For practical purposes it is necessary to simplify in thought the limitless complexity of actual phenomena. Thus we come to think of one of the innumerable hotnesses that can be perceived in and about it as the real "temperature" of a warm body; the sensation which a buttercup yields under certain standard conditions of perception becomes "the colour" of the flower. Other hotnesses and other colours tend to lose their substantive character and are reduced to the status of signs of these. This process of simplification is not confined to common thought. The progress of science, while it reveals wider and deeper complexities in Nature at every stage, shews also that a conceptual simplification of its data is constantly becoming a more essential condition of theoretic success. The existence and importance of this tendency in physical science has no doubt had great influence in determining the philosopher's cultivation of the same tendency in his department. Allied to this inveterate pragmatic habit is a prejudice not unlike the

prejudice that has led some people to reject the idea of immortality on account of the appalling number of souls that would share it! Under its influence we are concerned at the enormous number of qualities with which Realism would endow the commonest body. By supposing these qualities to enjoy only a temporary existence in the mind of an observer we seem to effect a great economy of material and to clear Nature of the suspicion of reckless prodigality.

In the next place there are certain experiences—my pains and pleasures, my memories and imaginations—which in some sense often belong to me alone and are not, like my perceptions of the physical environment, shared with other people. The objects of these experiences come, therefore, to be thought of as psychical, as part of my mind. But error and illusion in the province of sense offer other examples of experiences whose essence it is to belong to me alone. When reflexion begins to work upon these experiences it readily follows the same method as in the province of physical phenomena. Just as the physicist seeks to reduce the whole of his universe to matter in motion, and to carry out this purpose feigns “concealed masses” in movement where no movement is, in fact, verifiable; so the psychologist, starting with the belief that he has good reason to consider the objects of his errors as well as his feelings and images as parts of his “mind,” comes eventually to think of all the facts of experience in terms of hypostatised “states of consciousness,” even in cases where there is no pretence that these pieces of consciousness which have extra-mental objects are verifiable. In other words, the “mind” as we have it in orthodox psychology is largely a methodological postulate—an expression of the need which a special science feels to reduce all its data for theoretical purposes to a common denominator.

The Alternative View.

The upshot of the foregoing discussion is that the premises upon which the proof of the psychical nature of sensations rests

are merely plausible assumptions or pragmatically useful postulates. They present, therefore, no insurmountable barrier to those who feel impelled to take another road than the one they mark out.

This road starts from the recognition that in perception the object announces itself as having a certain priority to and independence of our act and that this announcement is itself the sufficient certificate of the object's extra-mental status. It is important to observe that Mr. Stout also admits,* under the name "immediate inference," an element in sensational experience which guarantees that we are dealing with extra-mental realities. This element is, in fact, implied by the statement that sensational qualities are the data of perception. If our sensations "could be known in pure isolation from aught else they would not be data." "An isolated datum is a contradiction in terms." There is no difficulty in accepting this principle. Divergence appears only in its application. For Realism as here conceived, the further truth which the sensation "reveals" is its own extra-mental existence. For Mr. Stout the further truth is the existence of an extra-mental reality correlated but *not* identical with the sensational quality. No doubt sensational experience often guarantees the extra-mental existence of something more than the qualities which appeal to the special senses. Through sensational experience the subject may be brought into cognitive relations with the "thinghood" or real extra-mental nexus that unites the sensational qualities. But I can find no warrant for the statement that while the sensational experience gives adequate data for immediately inferring the extra-mental existence of "thinghood" it gives no reason for inferring also the extra-mental existence of the sensations themselves. It is apparently because Mr. Stout holds the opposite opinion that he feels entitled to object to Mr. Alexander's appeal to the facts as irrelevant to the problem

* NB

* First paper, p. 159.

under discussion.* To meet this objection I urge that the character of extra-mentality announces itself in and with reference to "that which is existentially present to my mind in perceiving physical things" as well as in the physical things which it is the means of my perceiving. It announces itself in the colour of the buttercup even when my eye has become so trained that the colour quality actually presented is no longer accepted as merely a symbol for a normal quality; it announces itself in all the hotnesses that I can feel at different distances from a fire, though in this case there is no normal quality of which they can be the symbols. In neither of these cases, nor in any comparable case, can I find in the experience itself any indication that I am dealing with temporary existents in my mind which "represent" the physical thing outside my mind.

The path which I propose to follow from this starting point is determined by a postulate offered as a substitute for the postulates of the orthodox view. That in the perception of a physical thing the subject is in relation with no psychical intermediary "on the object side" but with the thing or certain features of the thing itself—this seems not only to be a datum of the experience, but also to be part of the plain man's view. *Mutatis mutandis*, the same can be said when the object of the cognitive relation is an isolated quality—such as a smell or a colour—which is not a representation of a thing in the ordinary sense of the word at all. Careful introspection and the plain man agree in pronouncing the object to be extra-mental—to be an entity capable of entering into the subject-object relation, but to be in its own character unaffected by the presence or absence of that relation. The postulate in question lays down that in philosophising, though I may rectify and add to the plain man's view, I must not contradict or explain away any essential positive features of it. I venture to make it clear (repeating what I have said elsewhere) that by the plain man I

* Second paper, p. 229.

do not mean any particular species or variety of the genus *Homo*, but a being included in the wider self of each of us. The plain man is the original stock upon which the psychologist, the physicist or the metaphysician is grafted; and it is he who, while he supports and nourishes this more or less desirable parasitic growth, still conducts those activities that form the common core of human life from China to Peru. To say that the positive features of his view of the world must be preserved is to express the belief that his vitality supplies everywhere the data upon which departmental activities—such as those of science and philosophy—operate, and that if those activities lead to results contradictory to the plain character of the data from which they start, they are pursuing a course which must end in futility if not unintelligibility.

The systematic application of the principle that what is existentially present to the mind in perception is something extra-mental—something that would be as it is in perception even if it were not perceived—soon leads to results which do not form part of the plain man's view, simply because they are matters of departmental interest. These may be approached by other results which probably do form part of his view. Thus every one holds that there are things which "have" one colour by day and another by artificial light. In such cases neither colour is taken as a symbol of the other; they are accepted as co-ordinate substantive features of the thing, each presented to perception in the appropriate circumstances. It is easy to see that the yellow buttercup is simply a pragmatically simplified case of the same kind. The buttercup actually owns all the colours that may be presented under different conditions, though in actual experience most of them are liable to be degraded to the position of symbols of those presented under normal conditions.

But more difficult cases soon present themselves. Imagine a number of persons spread along the circumference of a large semicircle while a motor car from which a whistle of constant

pitch is sounded moves rapidly along the road which forms the diameter. Then, as is well known, not only will each person at a given moment hear a note different from the notes heard by his companions, but the note heard by each is different for different positions of the car. Moreover the occupants of the car will hear all the time a steady note which, except momentarily, is heard by none of the bystanders. Are we to maintain that all these diverse notes are being simultaneously "emitted" by the whistle? With a proper interpretation of the word "emitted" I believe that we can and must answer, Yes. The experience of hearing a note seems to me to contain as part of itself the announcement that the note is extra-
mental—that it is, so to speak, there to be heard. Since this is true of each of the notes—none of which presents itself with a certificate of superiority over the others—I accept the conclusion that the creation of this multiplicity of notes to be heard is part of the phenomenon which is called blowing the whistle. If, for example, the note happens to be so high in pitch that it lies outside the limits of A's audition, while B, who is standing beside him, continues to hear it, then it seems to me just as certain that the note is really there for A to hear if he could but hear it as it might be in another case that there was a pin on the floor for him to see if only (like the sharper-sighted B) he could distinguish it.

I have said that in connexion with this case the word "emitted" must receive a proper interpretation. It refers naturally to the pragmatically simplified view in which the whistle is thought of as yielding its note under certain standard conditions—namely when whistle and hearer are both stationary. This view must be rectified by the aid of the science of acoustics. The thing that is really sounding is the air, the whistle being concerned merely in setting up a definite type of aerial wave-motion. (If we substitute a bell for the whistle, bell and air together constitute the sounding thing.) If at any point a given number of "air waves" reach the ear

in a second then there is correlated with that "frequency" a definite note to be heard. The air vibrations do not constitute the "reality" of which the note heard is merely an appearance or mental effect. The same thing can be said of the phenomena that occur along the line from the tympanum to the cortex of the brain. Both kinds of phenomena are undoubtedly events that happen, but they happen *as well as* the occurrence of the note, and are merely the ordinary accompaniments of its perception. I insert the word "ordinary" here because I hold that hallucinations can be interpreted quite as fairly as evidence of the independent status of sounds as of their psychical character. As in the case of hallucinations of pain auditory hallucinations may at least in some cases be due to the setting up of cognitive relations directly between the subject and a sound without the intervention of the usual physical and physiological machinery. If (as seems possible) auditory hallucinations are occasionally veridical this evidence would, I think, be a good deal strengthened. Moreover, as we shall see later, normal psychology has been thought to give evidence for the view that we may have sensations unmediated by material events of the ordinarily appropriate kind or by stimulus of the ordinarily appropriate organ.

The case of the hotnesses perceived round a body of high temperature is still more complicated, for here the condition of the part of the body that acts as perceiving organ partly determines the object to be perceived. As the condition of this organ changes during the observation the hotnesses observed will change also. These facts are not to be interpreted as proving that the hotnesses existentially present to the mind are psychical, but they do show that the plain man's view of a hot thing requires rectifying and supplementing. Not only must the thing be thought of as owning an indefinite number of hotnesses disposed spatially about it; it must also be recognised that the disposition of these hotnesses depends in part upon the hotnesses belonging at every moment to

neighbouring bodies. Both of these ideas are in principle familiar to physical science as well as to metaphysics. Physical bodies are not isolated reals, each wearing its own qualities without any regard to the condition of any other body. In certain cases, capable of empirical determination, bodies reciprocally "take note" (in Lotze's phrase) of one another's condition, and express this notice in their own states. Again a thing must not be thought of as limited by a precise spatial boundary. It may be necessary to think of it as filling an indefinite part of the material universe. The thing need not on that account cease to be a definite real complex of primary and secondary qualities which could be conceived to be withdrawn from the universe as a whole.

With this corrected view of the scope of the word "thing" we can attack the interpretation of other cases of perception. If I look at a distant ship through a telescope or at an insect through a microscope I "see" the objects by means of sensations that I could not acquire by the naked eye. No special question of the relation of the sensations is thought to be raised here, because the information given is congruent with information afforded to other senses or to the naked eye under other conditions. But if I look at a straight stick in water I obtain sensations which are not congruent with those given to another sense or to the visual sense in the absence of the water.

All these cases are really in equal need of the application of the wider concept of the "thing." There are relations between the ship or the insect and the lenses of the instrument which, on a sufficiently strict view, must be thought of as making a difference to the object observed. It just happens that the difference is perceptible only from the point of view of the observer at the eye-piece. In this respect the case differs from what would happen if we directed a rod of iron towards a coil conveying an electric current: for the difference here would be observable from many points of view. There is,

nevertheless, in the cases considered, an equally genuine difference made in the thing; for the disposition of its visual characters is changed. The case of the stick in water is complicated by the fact that the change in the disposition of the visual characters produces effects which in normal cases would belong to a bent stick. There is, however, no reason on this account to doubt the pronouncement of the experience that the visual qualities characteristic of the modified thing before us have a real extra-mental status.

Error and Illusion.

At this point it will be convenient to direct the discussion to the question of Error, which is generally supposed to offer peculiar difficulties to such a theory as the one here outlined. If in sensational experience you are merely reading off the facts about extra-mental realities, how (it is asked) can sensations ever lead you astray? Yet the existence of error and illusion is a fact that we constantly have occasion to acknowledge.

Without professing to have a completely satisfactory answer to this objection, we may do much, upon the view I am defending, to limit the field of its application. Many of the stock examples can be shown not to be cases of error or illusion in any sense that constitutes a stumbling block to a realist theory. Thus, if I identify the note of an engine whistle as upper C when the note "really" emitted is C sharp, my "error" may be due either to my ignorance that the engine was moving away from me at the rate of 44 miles per hour, or to my ignorance that this circumstance would make any difference to the sound heard. But although, owing to my having insufficient data before me, or to my lack of knowledge of their relevance, I may entertain a wrong belief about the whistle, my failure does not falsify the guarantee of extra-mental reality that my perception of the sound gives. We may deal similarly with the mistakes in matching colours

made by a normal person in artificial light or by a colour-blind person in daylight. There is no error or illusion here, in the sense of an attribution to the things of colours that they do not really own. The full extent of the mistake consists in ignorance that the colours which agree when seen under the given conditions of perception would not agree under other conditions of perception. In the case of the colour-blind person there is the additional circumstance that physiological conditions may never permit perception of the colour which in the pragmatically simplified concept of the thing is thought of as its "true" colour. In the same way there is no difficulty in the case of the water which appears warm to A and cold to B. To me it seems true, not only that both the warmth and the coldness are really experienced, but also that, under the appropriate conditions, both are *there to be experienced*. Error need consist in no more than one observer's ignorance that the other observer is not necessarily in cognitive relations with the same extra-mental reality as himself. Unlike Mr. Stout, I can find no more "contradiction" in the simultaneous attribution of the warmth and coldness to the same water* than in the simultaneous attribution to it of warmth and acidity. Only empirical experience can decide what qualities it is possible, and what it is impossible, for a body to wear together, and we must admit that experience shows that warmth and coldness simply are not among the qualities which exclude one another. It is true that I may not think of the same part of the water as having more than one "temperature." But the temperature, thought of as the "real" state of hotness or coldness of the body, is a concept of merely pragmatic validity. It is a symbol for the totality of the experiences of hotness and coldness obtainable from the water at the moment in question, each under its proper conditions of perception. Obviously there would be a contradic-

* Second paper, p. 238.

tion in supposing this totality to have simultaneously two different expressions, but there is no contradiction in supposing its single expression to consist in a variety of details. It may be added that the use of a thermometer to determine temperatures rests upon the fact that with some substances (though not with all) there is a one-one correlation between their volumes under a given pressure and the totalities which are properly to be thought of as the temperatures of the substance.

In the case of the "straight staff bent in a pool" there is, again, no illusion with regard to the visual appearance. It does not merely appear to be bent: it is bent. Error here can only take the form of inferring a correlation between visual and tactual and other experiences which does not exist. This error may spring either from ignorance that the staff is partly in water, or from ignorance of the visual aspects belonging to a straight staff in these circumstances. The staff in water is (as was said before) not really the same thing as it was out of the water. Certain characters of the new thing are identical with those of the old, but its visual characters are changed. They are not reduced to a chaos, but a fresh set of experiences would be necessary to give *a posteriori* knowledge of the correlation between them and the other characters. I can see only one serious objection to this account. It is that the visual characters of the staff under water are not in the same place as the tactual characters. At first sight this fact is undoubtedly a difficulty to a realist who believes—as a realist probably must do—that even if there are divers, mutually exclusive spaces, yet the visual and tactual characters of a physical thing must be in one and the same space. It is, however, not insurmountable. There are many familiar instances in which different characters of a body occupy different parts of the same space. For example, the magnetic characters of a piece of iron are not all found in the same place as its chemical characters. We may thus legitimately

suppose that in the case of another special form of physical thing—a straight staff in water—the visual characters and the tactual occupy different positions. This explanation covers also the important cases of the object seen through a magnifying glass or telescope, and the still more common case of an object seen by reflexion in an ordinary mirror. In all these we have visual characters which are undoubtedly correlated with tactual characters but occupy different parts of the same physical space.

It is pertinent to note in this connexion that it has been thought possible to explain some well-evidenced cases of apparitions only on the hypothesis that the visual unaccompanied by the tactual and other characters of a dead or absent person were really occupying a definite position in space before the observer.* Whatever value such an explanation has in these cases it is instructive to find it proffered from the point of view of empirical science by a thinker whose aim is, not to construct a metaphysical system, but merely to understand a certain group of facts.

More Difficult Cases of Illusion.

The foregoing cases of error and illusion offer, I think, no real difficulty to the theory of this paper, because, though they imply incomplete knowledge and (therefore) false inferences, they do not involve internal discrepancy in the content guaranteed by perception. There is no evidence to contradict the statement which the facts give us about themselves. Any such evidence consists merely in deductions from presumptions for which no proof has been offered—presumptions which may, like Euclid's last axiom, be denied without resulting inconsistency. Our theory has a harder task when it faces genuine cases of perceptual illusion—that is, cases where sensational experience seems to guarantee the existence of things that nevertheless can

* Myers, *Human Personality*, Chap. VI.

be proved not to exist. A realistic theory cannot live upon the principle that there is an element in sensational experience which pronounces authoritatively that we are dealing with extra-mental data, but that sometimes when this pronouncement is given the data are not extra-mental after all. The demonstration of the occurrence of such cases would necessitate either the withdrawal or the radical modification of the theory.

Sounds
like
* S's
phenomena

Before examining instances which threaten the realist with these unpleasant alternatives I wish to draw attention to certain considerations of importance. The first is the consideration pressed by Mr. Bradley when he was entering upon the discussion of the same problem. Realism is not bound to explain the whole of the facts of error and illusion. "A general doctrine is not destroyed by what we fail to understand. It is destroyed only by what we actually do understand, and can show to be inconsistent with the theory adopted."* Why error and illusion are "permitted" (to use the old phrase) is a problem that no system of philosophy has solved. It must suffice if we can show that their phenomena can be described in terms that do not imply a contradiction of our main theory.

The second consideration is that although the full explanation of error and illusion is more interesting to Realism it is not actually more important than in other philosophies. No matter what form a system gives to the concept of Reality the specific quality of perceptual experience is an element which it is illegitimate to disregard. We may minimise its value, but an explanation of its existence and distribution is an indispensable part of a theory of experience which promises to cover, even in outline, all the ground. But such an explanation of the distribution of the sensational quality demands a better account of error than is given (for example) by either of the prevailing philosophies. In Absolutism as represented by Mr. Bradley we learn that the existence of error and illusion

* *Appearance and Reality*, Chap. XVI.

causes no difficulty, because every affirmation made by a finite mind about a finite subject suffers from the need of supplementing and rearrangement in which error consists. But although in this way Absolutism avoids the necessity of treating error it has not explained it. The difference between the relations to reality of the judgment "It is raining" when in one case it *is* raining, and in another it is *not*, is the specific difference that calls for explanation. To show that the two judgments merely represent different degrees of untruth is to avoid, not to proffer an explanation of this difference.

Similarly with Pragmatism. The sensational quality has become attached (we may suppose) to certain types of presentations as the mark of a peculiar relevance to universal human purposes. I may act successfully upon the perception that a friend is approaching in a way and for purposes not possible if I merely called up a visual image of his approach. If my reaction to the perception does not lead to the normal satisfactory results the perception was erroneous. This idea, when expanded, leads to a very illuminating psychological description of error and illusion, but it leaves quite unexplained how a feature of such immense epistemological importance as the sensational quality can be misplaced, and attempts no estimate of the metaphysical significance of the misplacement. It is impossible to judge of the adequacy of a system of first principles before it has come to grips with this dangerous and treacherous problem. The special disadvantage from which Realism suffers is not that success here is more vital to it than to its rivals, but that it must be gained at an earlier moment in its career.

It may be added that perceptual error seems to offer in Mr. Stout's theory precisely the same difficulties that it offers to the theory proposed in this paper. The *differentia* of sensational experience is that it presents me with data from which I may infer immediately the presence of an extra-mental existent or physical body. But how can this account

be true if sometimes (as in hallucination) when sensational data are given the inference is incorrect? It would be equivalent to an admission that although "Some Q's are P's" is an immediate inference from "All P's are Q's," yet in certain cases the conclusion does not follow. Either the immediate inference must always hold good or else there is no inference at all, but merely such a "coefficient of correlation" between the presence of certain sensations in my mind and the spatial presence of certain physical things, that in most cases, when I have the sensations, it is a safe shot to guess that the physical thing is at hand. But if there is merely this external relation between sensation and thing we are obviously brought back to the old puzzle of how we know anything about the thing at all.

It is clear, again, that Mr. Stout's theory does not escape the difficulties presented by illusion (as distinguished from hallucination). He does not maintain that my immediate inference from sensational data assures me merely that an extra-mental reality is present. He conceives it as going at least some way towards the specification of that reality. That is clear from the statement that we know (*i.e.*, immediately infer) the circular body to remain unchanged, though we may have a vast number of different views of it. If, then, Mr. Stout "recognises" a person as a friend, and subsequently finds that he has addressed an entire stranger, he is confronted with exactly the same difficulty as the realist who rejects intra-mental sensations. The very being of sensations is to yield immediate inferences of a certain class—a class which must be taken to include the recognition of different human forms when we meet them. Nevertheless, here is a case in which the immediate inference is wrong. How can this result be reconciled with the original view of the relation between sensation and extra-mental reality?

A large number of ordinary cases of perceptual error can be brought in part under the heading of *inadequate discrimina-*

tion. It is universally known that attention, and above all practice, may make an immense difference to the number of data which I can discriminate from one another in any sense-field. We must infer from this fact that, although the experience guarantees the extra-mentality of the data as far as discrimination goes, it always fails to discriminate, and so leaves unasserted, some features of the object which (we may believe) are yet there to be sensed. The difficulty of discrimination is greater as the intensity of the sense-qualities diminishes, until at length it may become impossible to recognise with certainty that the sense-quality is really present. It becomes impossible, for example, to discriminate between a very feeble illumination and a visual image. It is probably untrue to say here that the experience's pronouncement of its own character is illusory; it is the nature of the pronouncement itself which is in doubt. When in this case there is a strong external bias in favour of one pronouncement rather than the other a genuine illusion may occur. This was the case, for example, with M. Blondlot and the N-rays. In such cases the observer does not really ascertain the verdict of the experience at all; he substitutes for the actual data a construction more or less different from the data, but either wholly or in part suggested by them. He proceeds to *use* this substituted experience without further inquiry, just as if he had consulted its verdict upon the character of its contents. There are in normal psychology many instances of this tendency which approach illusion more or less closely. As is well known, a young child, in drawing a profile picture of a man on horseback, will not only give the animal credit for all the limbs which he knows it to possess, but will treat the rider with equal generosity in respect of his eyes and his legs. Yet the intention of the artist was to picture man and beast as he actually saw them. It is by no means uncommon to find unsophisticated children of a considerably greater age who, if they have a tendency to left-handedness, will produce of an animal with his

head towards the right a picture showing the head turned to the left. They mean to draw the animal as they see it, and, until the discrepancy is pointed out, are not aware of its existence. Doubtless they have constantly substituted for the sensational data an imaginary construction suggested by them, a construction better adapted than the original to guide the work of the pencil. Through the very fact that it is used as the guide to action it is temporarily believed in, though careful inspection at once shows that it is only a substitute for the real sensational data. Most of the common cases of perceptual misinterpretation receive a similar explanation. The sensational data actually guarantee the presence of certain extra-mental characters, but before these have been adequately discriminated the object is replaced by a mental construction whose elements are more or less congruent with the actual data, and whose connexion with our previous experience and our interests qualifies it to direct action effectively. The details of this construction are not examined from the point of view of their character, but it is assumed that they have the sensational character attached to the original data until the results that follow from this unconscious assumption cease to be compatible with it. A more careful examination of the data follows and at once dispels the illusion. It should be noticed that this tendency to replace original sense data by a mental construction (or "hypothesis") which forms a readier guide to practical or theoretical activity is in another form the characteristic of physical science. In the opinion of some critics of science the practical success of the mental construction here also leads to something very much like illusion.

Hallucinations form a more difficult subject of inquiry, but it is possible that the difficulty arises largely from our lack of reliable introspective knowledge of them. In some cases, for example, the sensational quality may be absent from the data, and we may have merely another case of a construction of intra-mental origin which comes to determine action as if it had been

based upon sensational data. In other cases—such as many well-attested apparitions and hallucinations of sound (*e.g.*, the daemon of Socrates and the “voices” of Joan of Arc)—the evidence at least warrants the speculation that real sensational visual and auditory characters are directly cognised without the help of the ordinary mediating machinery. In yet other cases the theory of Dr. Boris Sidis* may prove a way of escape from the difficulties of the situation. Upon this theory we must distinguish in normal perception between the primary sensations which result from the actual stimulus of a sense-organ, and form the core of the perceptual experience, and the fringe of secondary sensations, reminiscent of former experiences, which form the “complication” of the former. In an hallucination there is no primary sensation, but a fringe of secondary sensations is excited, and therefore gives the whole abnormal experience a character which is taken as sensational. If Dr. Sidis’ distinction between primary and secondary sensations can be maintained, it would follow that only the former could be regarded as evidencing the physical presence of a quality. The latter, though nearer in quality to primary sensations than to images, must yet, no doubt, be distinguished from the former by careful discrimination. They may, for example, be somewhat analogous to after-images and the light seen on pressing the eyeball—phenomena which are quasi-sensational in character, and may by inadvertence be thought to give the guarantees of genuine sensation, yet can with attention be easily discriminated from such sensations.

There are other forms of illusion and error which in a complete review would demand treatment. Possibly, enough has been said to indicate ways in which in the most important cases the existence of error can be reconciled with the theory that sensational experience carries with it a guarantee of

* *Psychological Review*, Vol. 15, pp. 44 and 106.

the extra-mentality of its content. A more detailed consideration would probably prejudice the case for this view by the importation of elements of weakness due not to the nature of the view itself but to the inadequacy of the apologist.

The Difference between Primary and Secondary Qualities.

In conclusion, I should like to speak very briefly about the view expressed by Mr. Stout that the important difference between primary and secondary qualities is that "the executive order of the material world can be expressed only in terms of the primary and not in terms of the secondary properties of matter." While, on the whole, this statement is no doubt true, and does correctly describe the difference between primary and secondary qualities, yet it is not true absolutely, and the recognition of exceptions should do much to rehabilitate the reputation of secondary qualities in the eyes of those who tend to regard them as merely subjective consequences of the causal action of the primary qualities. As I have tried elsewhere to show*—following the most competent critics—no attempt to present all physical phenomena as cases of matter in motion has been really successful, and the concept of temperature and the properties of temperature are still essential elements in the description which science gives of the executive order of the world. This consideration taken with others suggests that the real source of the supremacy of the primary qualities in physical science is the readiness with which their determinations submit to correlation with the number series, and to the peculiarity which makes it possible in their case to adopt the device called measurement. Only in the case of temperature has it hitherto been found possible to submit to numbering and measurement concepts based upon secondary qualities. Hence it follows that among these

* *Aims of Scientific Method*, Chap. IV, esp. pp. 112-122.

qualities temperature alone enters into the formulation of, the executive order of the world.

II. *By* F. C. S. SCHILLER.

Little did I anticipate a year ago that my incautious willingness to be second to Dr. Nunn would commit me to a discussion of all the fundamental issues which are raised in his most lucid and forcible paper, which impresses me as the most effective presentment of the case for Realism which I know. I feel keenly, therefore, that the proper respondent in this discussion was indubitably Professor Stout,* and not one to whom the terms idealism and realism have long ceased to convey any definite meaning, the first because it has become too ambiguous, and the second because its champions have not yet succeeded in expressing what it means, though it is clear that of late they have really been thinking furiously, in a way that contrasts most pleasingly with the intellectual paralysis of idealism. And I am the more reluctant to act as the antithesis to Dr. Nunn's thesis that I have really no quarrel with Realism as such. I am quite willing to believe it, if in any of its forms it will only tell me clearly what precisely it wants me to believe. Hitherto I have not been told; but Dr. Nunn is so clear-headed that a discussion with him may go far to clear up my perplexities as to what Realism really means.

I.

Let me begin therefore with a string of questions, and ask him to tell us what he means by his terms, especially those he has not defined.

(1) First of all, what does *independent* mean to a realist? Until its meaning is ascertained, the meaning of Dr. Nunn's

* Who, however, may I hope be present to deal with that part of Dr. Nunn's paper which is addressed to him.

thesis must remain conjectural. I hope, therefore, that the question is not as unanswerable as it has proved to be to the idealists, to whom I have now for some years addressed it in vain.* The question moreover is particularly pertinent to Realism and indeed even vital. For unless an intelligible sense can be assigned to *independent*, it collapses on the threshold of its career.

More particularly it would be instructive to elicit Dr. Nunn's answer to the question whether *independence* does, or does not, exclude *relation*. If (a) it does, does not the *independent* inevitably become unthinkable? If (b) it does not, how are relations which destroy *independence* to be distinguished from those that do not, and will Realism kindly publish a list of relations which are compatible with *independence*? I should venture to anticipate that the second alternative will have to be the one adopted, but that the distinction between the two sorts of relations may not be altogether easy to establish.

Still greater difficulties, however, seem to lurk in the question of the relation of *independence* to *cognitive activity*. Of course the crudest form of realism will at once answer that it denies all cognitive activity. Reality imposes itself on the mind (if there is a mind) *vi et armis*. But Dr. Nunn's realism is by no means crude, and his opinion is the more valuable to elicit. Let me ask him, therefore, whether he thinks it possible to hold that into what can properly be called *independent* "fact" there has entered any human contribution or construction, due *e.g.* to attention, habituation, discrimination, selection, etc. If (a) he answers *No*, he will have to give us an example of such an absolutely independent fact; and I fear that so skilled a psychologist may find it extremely difficult to find a fact wholly purged

* Cf. *Studies in Humanism*, p. 95; *Arist. Soc. Proc.*, 1909, p. 87 f. Mr. O. C. Quick (*Mind*, No. 74, p. 223) quite rightly notices the popular use of the term, and admits its ambiguity, but goes on using it. Surely as soon as an ambiguity has been detected, technical philosophy should insist on discrimination.

of every taint of "mental" activity. If (*b*) he answers *Yes*, he will have once more to indicate the point at which "facts" begin to depend on human activities.

(2) What does Dr. Nunn mean by *extra-mental*? And how is it related to *transcendent*? Does he mean to use it in a common-sense way or in a metaphysical? Is it something which transcends experience in general or only extends beyond the experience of the moment? Would he admit that in the latter case it only means "in space," and may comfortably remain immanent in experience and transcend only the limits of the "mental," as psychology has found it convenient to define it? In short, is he conceiving "extra-mentality" from the standpoint of the metaphysician, of the plain man, or of the psychologist?

I inquire chiefly because, in the past, realisms have been extremely confused on the subject. But I cannot say that Dr. Nunn's paper makes its standpoint entirely clear to me. I am puzzled, in particular, to understand why, if he holds (as it seems to me, rightly) that "mind in orthodox psychology is largely a methodological postulate" (p. 200), he should not conceive "extra-mentality" as an equally relative postulate. Surely if this *aperçu* be pursued, the meaning of "extra-mentality" will be found to vary according as it is taken from the standpoint of the "plain man," of the psychologist, and of the metaphysician, so that what is quite properly taken to be "in space" by one, *e.g.*, a hallucinatory sound by its victim, is as properly labelled as subjective by the psychologist, without thereby falling out of the totality of reality, as the metaphysician loves to conceive it.

(3) I would next inquire whether Dr. Nunn's realism does not owe us a further account of "the subject-object relation." Does he, or does he not, hold that the existence of this relation suffices of itself to constitute the object's "reality" in a realistic sense?

If (*a*) he does, of what nameable thing can reality be

denied ? How can anything be too fantastic or illusory to be an object to some subject ? Moreover, does not the "proof" of Realism become child's play, and conduct us to the humorous conclusion that *the same fact*, namely, the existence of a perceived world, is appealed to by Idealism to prove the "dependence" of all reality on a knower and by Realism to prove its "independence" ?

(b) If, on the other hand, we recognise that this *formal objectivity* of every object of thought as such is *not* sufficient to constitute its reality in the realistic sense nor what common sense means by "reality," is not Realism confronted with a further problem of great complexity and enormous vital importance ?

The various kinds of *formal objects* or *reality-claims* have still to be sorted out, and its proper index of reality has to be assigned to each. Discriminations must be made between the "reality" of a dream, of a hallucination, of a memory, of an image, of an after-image, of a "primary" quality, and of a "secondary," of a "thing," of a fiction, of conflicting experiences, of a physical, of a metaphysical, and of a religious hypothesis, etc. These discriminations are, in point of fact, made with considerable precision by the "plain man," and by the working methods of the sciences, though in certain directions both require further refinement. But the realist's indiscriminating haste to affirm the reality of the objects of thought seems as a rule to overlook all this. And can he suppose that all the distinctions which, with infinite pains, men have effected were made without good reason, out of sheer perversity, or for the mere fun of the thing ? If not, where would be the gain, either to ordinary life or to science, or in the end even to philosophy, in obliterating all this work and simply replunging all discriminated objects into the rag-bag he labels "reality" ?

It may be that some of the words used in these vital discriminations, such as "mental" and "psychical," are not

the best available ; but what does this matter so long as they are useful for classifying objects, and if they are, are their defects worth making such a fuss about ?

(4) I have already indicated that I have some difficulty in ascertaining from what standpoint Dr. Nunn is speaking, and on what plane his discussion moves :—

(a) At times he is clearly speaking for the “plain man,” whom he rightly describes as a delightfully pragmatic creature (p. 203). But surely, on this plane, what is “outside” “me” is simply “in space.” The plain man’s mind harbours no antithesis of “mind” and “matter,” but is glad when it can distinguish even “soul” and “body” ; while, as for what “extra-mental” means, the plain man knows as little as I.

(b) Dr. Nunn accordingly soon involves him in perplexities, and subjects his plain humanity to psychological sophistication. The plain man is a thinker only in order to be a doer, his thought is full of “pragmatical simplifications” which ignore irrelevant differences. Dr. Nunn cannot stomach his rough and ready ways. Rather than let him say that the motor car’s whistle sounds differently to different people, he insists that it may be said to “emit” the same sound, if only the word “emit” is “properly interpreted” (p. 204). And subsequently it appears also that the plain man’s view of the scope of the word “thing” has to undergo serious “correction” (p. 206). Clearly Dr. Nunn’s realism is not the pragmatic realism of the “plain man” which we all practise.

(c) Lastly, what about the metaphysical plane to which Realism usually aspires to soar ? Dr. Nunn mercifully says little about it, but it is implied in calling his doctrine “realistic.”

How many planes, therefore, are necessary to Dr. Nunn’s flights ? His vehicle does not seem to be a monoplane, but whether it is a biplane or a triplane one would like to know. This doubt would not have arisen if he had only told us

whether his question concerned only the psychological distinction between "primary" qualities conceived as "independent" of the act of perception and "secondary" qualities conceived as (in various ways) dependent on it, or something simpler or profounder. As it is, the simplest answer to his question, and the one which seems to be strictly adequate, seems to be that, for some purposes, the distinction is valid because it is convenient, while for others it is not because it isn't.

II.

I fear that my initial questions have become more explicitly critical than I at first intended, and will therefore pass next to the point in which I found Dr. Nunn's realism most interesting and most manifestly superior to all the other realisms on record. He has found out what apparently realists have never before been able to apprehend, viz., why the plain man is not a metaphysical realist, but prefers to favour the idealist by declining to project *all* his experiences of objects into the objects themselves. It is *practically necessary* to distinguish, to simplify appearances, and to keep the number of "qualities" ascribed to objects within manageable limits. It is practically necessary to distinguish between experiences which may be treated as socially "common" and those which are non-transferable. And it is vitally necessary to distinguish between truths and errors, and to guard against the latter. These vital needs have indisputably contributed very extensively to fix the place where the line has been drawn between what philosophers call the "objective" and the "subjective" portions of experience. Dr. Nunn, moreover, recognises also that Science shares to the full this pragmatic procedure of ordinary life (pp. 199 and 215).

A few steps further in the same direction and he would have seen that herein lay the solution of his whole problem and the conclusion of a tedious and unprofitable controversy which has distracted philosophic attention from more urgent matters. He need merely have added to the perception that our

procedure is thoroughly pragmatic the declaration that it is thoroughly right, both because it is inevitable, and because it is successful.

This declaration, however, he does not make, and, instead, he seems at times to disparage our procedure as "of merely pragmatic validity" (p. 208), and as a "prejudice" (p. 199) indecisive of the question at issue.

Nevertheless, elsewhere he does not disdain to avail himself of this same method. He argues (p. 195) that a toothache, as a thing *to be reckoned with*, may be just as "real" as a cathedral; he prefers to believe in a cosmic reservoir and universal provider of toothaches rather than in their "subjectivity," because it is "*easier*" (p. 196);* he considers it "*safest*" not to risk the substitution of a standard perception for the whole series of sensations (p. 199). And above all, he thinks it possible to ascribe many errors to "*inadequate discrimination*" (p. 213).† This last pronouncement clearly implies both the relevance to purpose which humanism regards as the essence of all reasoning, and the need for attending, selecting, rejecting, and constructing, without which there do not arise any "objects" for thought to be concerned about.

But at present I cannot see how Dr. Nunn can reconcile these discrepant attitudes.

If all our activities of attending, discriminating, selecting, ignoring, and constructing are condemned as invalid, after the fashion of the cruder realisms, all thought and all science go by the board, and with them the procedures by which in fact we live and know. To such a realism, therefore, life, as actually

* One need not, of course, object either to the criterion of truth here implied, or doubt the correctness of Dr. Nunn's introspection; but he, for his part, should equally recognise that for other minds it may be "easier" to conceive toothaches as "subjective," and that in consequence the whole dispute reduces itself to a competition between relative conveniences of thought.

† I have italicised the terms which imply the humanist attitude towards objects.

conducted, becomes wholly irrational and incomprehensible. For the methods of "knowing" are essentially methods of vitiating "objects." If, on the other hand, these normal and indispensable procedures are recognised as valid, their validity cannot be based upon their form. It is vain to justify them as being self-evident in point of form, and infallible in point of fact. For it is too clear that they are not, and that they always involve a risk. It is always possible that we may attend to the irrelevant detail instead of to the essence of any problem. It is always possible that we may reject what is vital, and select what is unimportant. Nothing blinds men to the most obvious facts so surely as the preconceptions of a false theory, nor prepares them better for the observation of the most latent facts than the stimulus of a good hypothesis. But in neither case can our success or failure be ascribed to the logical form of our procedure. If, therefore, our procedure is admitted to be logically legitimate (and if it is not, logic must despair of comprehending any human reasoning whatever), it can only be legitimate because, in fact, it is successful. But if it is legitimate because it works, why should it be illegitimate to legitimate by their working the conceptions we have reached in this fashion ?

The hesitation of so many philosophers frankly to admit this, although they dare not explicitly deny it, I can ascribe only to the fact that they have not yet fully realised what enormous amounts of pragmatic postulation have gone to the making of the assumptions on which the plain man acts, and how complete would be the downfall of the whole fabric of life if the use of these assumptions could really be prohibited. Probably also, in spite of their efforts to rise to the plane of a truly critical philosophy, they are constantly relapsing into the common-sense attitude, and taking for granted an ordered world of "things" and "persons" acting on each other. Yet, though for practical purposes we all assume this, no critical theory of knowledge can regard this world of discriminated

realities as an original datum. Observation of our actual cognitive procedure clearly shows that there can be neither "things" nor "persons," neither "effects" nor "causes," until the chaotic flow of happenings has been set in order by successful discriminations. Every sort of distinct perceptual object, therefore, alike whether it be a "thing" or a "person," seems to be manifestly man-made, *i.e.*, relative to the human interests which singled it out, and preserve for it its status as a "reality" which it is expedient to take into account.

Either, therefore, "Realism" must recognise the reality of human activity, and content itself with the pragmatic preference of "realities" that work and acquiesce in the degradation of those that don't to an inferior order of reality (appearance, illusion, error, fancy, subjectivity, etc.), or it must set out on the quixotic attempt to resolve the cosmic order into chaos.

III.

The reason for the obscurity and confusion of Dr. Nunn's attitude towards the pragmatic procedures of our science is probably to be found in the fact that he has not fully grasped the all-important distinction which humanism makes between the *claim* and the *validity* of an experience, without which no critical theory of knowledge is possible.

(1) He allows himself to be imposed on by the formal claim to objectivity which all experience makes, and assures us that "sensational experience carries with it a *guarantee* of the extra-mentality of its content" (p. 217), and that "in perception the object *announces itself* as having a certain priority to and independence of our act and that this announcement is itself the *sufficient certificate* of the object's extra-mental status" (p. 201).*

* Italics mine. He also represents Professor Stout (p. 212) as having committed himself to a similar position. Professor Stout will doubtless speak for himself; but as I understand him his view is really more complicated, and does not assert the inerrancy of this self-advertising claim.

But (2) he also admits that this "guarantee" seems to be often deceptive, in "cases where sensational experience seems to guarantee the existence* of things that nevertheless can be proved not to exist.† A realistic theory cannot live upon the principle that there is an element in sensational experience which pronounces authoritatively that we are dealing with extra-mental data, but that sometimes, when this pronouncement is given, the data are not extra-mental‡ after all" (pp. 210-11). After all then the "guarantee" seems to be worthless, and Realism is not viable. The heroic equanimity with which Dr. Nunn accepts this result is admirable.§

* As a *formal* or as a *physical* "object" ?

† As physical objects.

‡ In the discussion Dr. Nunn assured me that this criticism rests on a misapprehension. I accept his correction of course, while regretting that my interpretation will not stand, both for my sake and for his. I had not grasped that on pp. 211-16 he had conceived himself to be *successfully* vindicating the value of the sensational "guarantee," and supposed him to be merely making *tu quoques* and pleading extenuating circumstances. It appears, however, that what Dr. Nunn really holds is not that the sensational guarantee should be retained though it may be deceptive, but that in cases of inadequate discrimination, hallucination, etc., *it is not given*. This, however, would seem to make matters distinctly worse. For (1) it does not appear how Dr. Nunn's realism is entitled to regard any objects which depend on human processes of discrimination as guaranteed to us or as otherwise than *vitiating* by this fact (*cf.* pp. 224-5). (2) It renders it all the more imperative that Dr. Nunn's realism should possess *some* trustworthy, or at least applicable, method of discriminating between the cases when the "guarantee" is given by "sensation," and cases when it is not, but *appears* to be, *i.e.*, between a real and an apparent guarantee. For the merely verbal device of saying that in cases of "hallucination" there *was* no *sensational* guarantee is *ex post facto*, and will not serve the purposes of actual knowing. We want to know whether what presents itself as a perception has, or has not, the sensational guarantee which is infallible. A guarantee which is technically infallible, but always capable of being superseded by a bogus imitation which guarantees nothing, is practically useless. (3) Whatever then enables us to decide whether or not we are truly perceiving what we seem to perceive will clearly go beyond perception and be the truly ultimate guarantee of truth. (4) I cannot see that Dr. Nunn's realism is entitled to make *any* distinction between reality and appearance at all. It has annihilated this distinction by

But I wish he felt more keenly (*a*) the logical monstrosity of this claim and the atrocity of its attempt to bluff him, (*b*) the extent of its *de facto* falsity, (*c*) its deadliness to all realism, (*d*) the vital need of finding a remedy for its ravages in practice.

(*a*) Surely a self-proving claim, which relies only on the vigour of its self-assertion, is the very acme of logical impudence. Whatever claims are made, and wherever they appear, they must be tested before they can legitimately be believed. A theory of knowledge that succumbs to such claims cannot but be utterly uncritical. For such a claim is intrinsically nothing but a psychical fact: its logical value remains to be determined. In no such cases, whether the claims are called intuitions or *a priori* principles, obsessions or delusions, sensations or hallucinations, can a reasonable and circumspect theory of knowledge accept assertion as a substitute for proof. Hence no pragmatic logician will for a moment tolerate such a claim: he will insist inexorably that untested "truths" are only "claims," that claims may be false, and that their real value will have to be established by their "consequences."

(*b*) In point of fact, false claims to physical reality are numerous. *In the moment of experience*, dreams, hallucinations, and illusions, nay, after-images and fancies, may put forward precisely the same claim to "objectivity" as "true perception," and it may be impossible to determine whether an experience is a true perception or not. Even after subsequent experience this may often be quite difficult. The controversies about ghost-seeing and revelation prove that, as to some of these cases, mankind has never come to an agreement, and possibly

calling all appearances indiscriminatingly "real," and indeed its insistence on the primary reality even of the "unreal" constitutes its essential originality (*cf.* p. 221). The truth is that Dr. Nunn ought not merely to refuse to offer even the lame explanations of error he attempts, but ought logically to deny the possibility of its occurrence.

never will, especially as it is quite conceivable both parties may be right, and that some of the disputed cases may be genuine, while others are not. Hence it is not, strictly speaking, too much to say that *every perception, just because we perceive in the light of a past experience which may be inadequate, is to some extent fallible*, and needs further experience to confirm and guarantee the trust we place in it.

(c) Is it not, then, fanciful to imagine that any uncorroborated and untested process of perception can guarantee any absolute metaphysical "extra-mentality"? Why, it cannot even by itself guarantee its pragmatic veracity! We cannot tell whether it is a true perception or not. Perception is always built up by present interest out of past perceptions, and this is the condition alike of "true" and of "false" perception. A pure sensation is a mere figment of theory, which no one can remember to have experienced. What is the use, then, of foisting upon us a criterion of reality which is fallible and cannot be worked, and habitually deceives us, if we are not critical of its pretence to infallibility?

"Realism," apparently, can only assert that all objects *claim* to be real, and that *some* of them may really turn out to be so; but if this be all, is it not still worlds away from constituting a theory of knowledge and a knowledge of the world?

(d) As human beings who, in order to live, have to cope with an unceasing flow of appearances, it is our right and our duty to demand of philosophy some means whereby we can actually make distinctions between truth and error, some procedure whereby we can attain the one and avoid the other. If no philosophy can satisfy our demand, our verdict about philosophy must be that it is only a game of make-believe which it amuses a few cranks to play. If some philosophies fail to help us, we are entitled to account them wrong and to refuse to listen to them further. If any philosophy prides itself on its indifference towards this discrimination and glories in the assertion that everything is at once true and false, and

that the purpose with which we judge it either does not matter, we must regard it as an insane aberration of the human spirit. If, lastly, any philosophy remains, which has not so far failed, it is surely worth examining.

It is not part of my function on this occasion to show that in point of fact the humanist philosophy does triumphantly solve all these puzzles, and give a meaning to the distinction of primary and secondary qualities which is consonant with common sense and common science. But I may point out that Dr. Nunn's criticism of the humanist treatment of the problem of error is too brief to be other than extremely misleading. It would hardly occur to a humanist to conceive the essence of error as a "misplacing" of a "sensational quality." The "misplacing" he would regard as a tautologous metaphor for an "error," and the "sensational quality" as a convenient (or inconvenient) abstraction. How a "sensational quality" may be "misplaced" in the absolute he would be content to leave an unprobed mystery; but how it could occur relatively to a human purpose he could easily explain by reference to the almost infinite ambiguity of an experience which is ever demanding further discriminations to effect more accurate adjustments of action. Nor would anything seem more obvious to him than that the more important a function was the more surely would it serve to sift the capable from the incapable, and, conversely, the better it sifted the more important it would be. From palæolithic times ordinary men have known that the fisherman who did not learn to allow for the refraction of his harpoon missed his fish and that the hunter whose arrow missed the heart of his lion lost his life, and that therefore "errors" of perception were vitally important: but apparently it has taken philosophers all this time to understand that it is precisely this vital import of sense-perception which has brought about the relatively considerable agreement which exists with regard to it among men.

In conclusion, let me say that the extent of my criticism is

by no means the measure of my dissent from Dr. Nunn, but rather of my appreciation of his paper and of his attitude. I thoroughly agree with him that philosophy must face the concrete problems of cognition as it has never done before. And I hope eventually to convince him that the truest philosophy is that which deals with them most conveniently and fruitfully.

X.—MR. G. E. MOORE ON "THE SUBJECT-MATTER OF PSYCHOLOGY."

By G. DAWES HICKS.

SOME apology is needed for introducing once more a topic for discussion to which already one of our meetings this session has been devoted. The substance of this paper should have been laid before the Society on the same evening as was Mr. Moore's, but, unfortunately, circumstances prevented the carrying out of that intent. On the Secretary's suggestion, I venture now to atone for a broken promise, and I can only trust that interest in the many important issues raised by Mr. Moore is not yet exhausted.

Naturally I shall touch chiefly upon points about which we appear to differ. With what I take to be Mr. Moore's main contention I am, however, in entire agreement, and I should like to express at the outset, if I may, my sense of the extreme value of so careful and thorough a piece of analysis as that which he has given us. Would that the following somewhat discursive remarks were less unworthy of being set beside it!

Mr. Moore begins his inquiry by stating at once what he conceives to be the subject-matter of psychology. In his view, psychology has for its subject-matter all those constituents of the universe, and those only, which are mental or psychical in character. Accordingly, the problem he prescribes for himself is to determine which among the contents of the universe are mental, and how they are distinguished from the non-mental contents of the universe. Briefly, his conclusion is that acts of consciousness, particular qualities of acts of consciousness, and any collection of such acts which have some sort of unity are undoubtedly mental entities, whilst it is doubtful whether the entity (if there be such) which sees and feels and thinks is

mental, doubtful also whether sense-data are mental, and doubtful whether there is any entity of the kind signified by the phrase "content of an act of consciousness," although, if there be, it would undoubtedly be a mental entity. I select for further consideration four questions,—namely (1) whether an individual mind or subject, which *is* rather than *has* its states, and is not a mere aggregate of them, is not mental in a more primary sense than the entities Mr. Moore finds to be undoubtedly mental; (2) whether the threefold distinction between act, content, and object, is not really justifiable, and, if so, whether the content is rightly described as mental; (3) whether it is not possible to define more precisely what is meant by an "act of consciousness," and (4) whether psychology can legitimately be restricted as regards its subject-matter to what is mental or psychical in nature.

One protest I feel impelled to record *in limine*. I am wholly unable to accept the criterion adopted by Mr. Moore in deciding between one or other of two opposing views,—I mean the criterion of immediate assurance yielded by introspective observation. Throughout his paper, Mr. Moore will be found falling back upon this kind of support. To take but one instance. He tells us that it seems to him quite certain that some mental acts differ internally or qualitatively from others. And the certainty apparently is furnished by the seeming. Now, one admits, of course, that at some point in logical procedure the process of offering grounds for what is asserted must come to an end, that we cannot go on indefinitely giving reasons for what we take to be true. But surely introspective observation is a precarious means of obtaining self-evident propositions. Introspection is proverbially difficult, and peculiarly liable, especially in regard to so intricate a matter as the internal nature of a mental act, to illusion. I am not saying that in Mr. Moore's case everything may not have been well, but, at all events, other observers—Mr. Joachim, for example—appear to be equally certain that they cannot, by introspection,

get hold of a mental act at all. And even though there *were* agreement as to what is introspected, I cannot see that this would guarantee freedom from error.

I.

"The sense in which to be a mental entity is to be an act of consciousness is," in Mr. Moore's opinion, "the most fundamental sense of the word 'mental'; it is the one from which all others are derived."

In order that one should be placed in a position for understanding what exactly this contention involves, some explanation of the qualification implied in speaking of mental acts as "*acts of consciousness*" seems imperatively called for. It has now become customary to describe psychology as the science of the mental life rather than, as used formerly to be said, the science of mental facts or phenomena. The change is not without significance. The employment of the term "mental life" indicates an effort at least to resist the tendency of regarding mental activities as distinct, isolated, independent occurrences, and to emphasise, as essentially characteristic of them, a peculiar, unique connectedness due to their being phases or stages in a stream of process constituting a concrete conscious individual. Psychologists are, of course, compelled, for purposes of investigation to make a momentary cross-section, so to speak, of the stream, but the absolute impossibility of dealing psychologically with any state of mind in abstraction from what has preceded and from what succeeds is, at length, I take it, a generally accepted methodological principle. Mr. Moore, on the contrary, is desirous, so I understand, of maintaining the possibility of giving a more or less satisfactory account of each mental act in and for itself. Nevertheless, I confess I am puzzled to find him *both* insisting on Hume's confusion of acts of consciousness with that of which we are conscious *and, at the same time*, admitting the possible truth of

Hume's doctrine of the individual mind as "merely the collection" of all its mental states. Does not the latter of these positions result, in Hume's case at least, from the very confusion which Mr. Moore has made manifest? The entire argument, for instance, about "personal identity" (*Treatise*, iv, § 4) seems to rest upon the assumption that the "succession of perceptions which constitute the mind" is the succession of data of which there is consciousness. Substitute for the phrase a "collection of different perceptions," in Hume's sense, the phrase a "collection of mental acts," in Mr. Moore's sense of "mental act," and the theory has become so transformed that I think Hume would disown any responsibility for it. He would probably require to be informed how a "collection of mental acts," apart from their objects, could in any way be conceived.

There might, Mr. Moore thinks, be acts of consciousness "isolated" in such a manner as not to be "related to any other acts, in the peculiar way in which the mental acts of any one person are related to one another." Professor James once attempted to illustrate the function of cognition by postulating a "little feeling of *q*," "attached to no matter, nor localised at any point of space, but left swinging *in vacuo*, as it were, by the direct creative *fiat* of a god." Could the god be prevailed upon to create a reality outside of the feeling, resembling the feeling's quality *q*, the feeling might then be held to be cognisant of the reality. Considering what he has told us of the sense in which he uses the term "act," I should certainly have imagined Mr. Moore could not mean that an "act," mental or otherwise, might "swing *in vacuo*" after the fashion of "this little feeling of *q*." And if, in calling the isolated acts in question "acts of consciousness" he meant to suggest that each might be the act of a separately existing entity—a bit, so to speak, of mind-dust—capable of just this one act, then I can only say that such a supposition strikes me as though it were on a par with the supposition that there might be fingers or thumbs, and so on,

each springing into being or created separately and living its own life, without forming part of any bodily organism.

Hume has to acknowledge in the end that the conception of the mind as a "collection of perceptions" is an unworkable thought, and to me the conception of a "collection of mental acts" seems a great deal more unworkable. The difficulty, however, is enhanced when the question is pressed how certain "acts of consciousness," as thus understood, can either give rise to the awareness, or become themselves aware, of themselves as *mine*. "There is *some* sense," says Mr. Moore, "in which *my* mental acts are all mine," and on the view that the mind is a collection of mental acts, he thinks a meaning can be given to this and analogous expressions. At the best, the meaning referred to could be a meaning only for a supposed external spectator, not for the subject whose acts are in question. Consider, however, how the matter stands in the latter case. I am often, it is insisted, aware directly of my mental acts as *mine*. Yet, after all, this is a metaphorical mode of stating what is meant. "I" am but a collection (or a series) of mental acts. Are we, then, to say that a *collection* (or a *series*) of mental acts is aware of each or any member of the collection (or series) as a member? Or are we to say that each mental act, as it occurs, besides being aware of an object, may be aware, and directly aware, of itself as belonging to a collection? Both alternatives seem sufficiently paradoxical. Is there, however, any other alternative?

Perhaps I have been labouring this doctrine unduly, for evidently Mr. Moore himself feels it to be unsatisfactory. He passes on to consider another possible view, very different in some ways from the foregoing, yet resembling it, I think, in other ways, and to which on the whole he seems inclined to lean. The mind, he holds, may be an entity distinct from every one of its mental acts and from all of them put together; it may, in other words, be mental in a sense different from that in which they are mental. I gather, from what is

said, that the theory intended is practically that advanced, in recent times, by Lotze. "We come to understand the connexion of our inner life," says Lotze, "only by referring all its events to one ego, lying unchanged alike beneath its simultaneous variety and its temporal succession."

It has always seemed to me that Lotze's own argument against Herbart is conclusive against this doctrine advanced by himself. To refer the maintenance of the unity in succession to the rigid unalterableness of what is ultimately real is, he maintains, an impossible division of labour; "change must find its way to the inside of being." If change be represented as mere sequence, as mere succession, then the contradiction which Herbart found in it would have to be admitted. But mere alteration, mere difference, never constitutes the whole of what is denoted by change. Change, as actually apprehended, is invariably continuous modification in which features of identity or unity are included. In thought, we may distinguish the aspect of identity from the aspect of difference, but we are not justified in taking distinctions of thought to necessarily indicate distinctions in real existence. It does not follow, therefore, that the identical uniting element is a separable constituent of the whole, to which the others are either added or from which they are withdrawn. Such is the general argument. But if these considerations apply to "reals," as Herbart conceived them, how is it that they are not also applicable to psychical existences, as Lotze conceives them?

Moreover, the line of reflexion that proceeds from the fact of the unity of self-consciousness to the notion of a metaphysical oneness of soul-substance is treacherous at every turn. Unity of self-consciousness—the unity which we are aware of in mature experience—evinces itself on psychological examination as no simple original datum of experience, but as a highly complex and derivative result. It cannot, therefore, be conceived as an efficient agent, directing and deter-

mining the relations of states of mind to one another, for it is itself the product of states of mind which are in some way already connected and related. Nor can the contention be sustained that the self of which in mature experience we are conscious *is* that assumed real ego which was there from the first, but of which in the earlier stages of mental history there was no awareness. Introspective observation here may, or may not, be trustworthy, but it can scarcely be said to yield support to the assertion that what I directly apprehend in and through the act of self-consciousness is a peculiar relation of what I call my mental acts to "some other entity which is me." What I thus apprehend would appear rather to be always a complex of certain more or less habitual trains of feeling, thinking, desiring, which, on account of their relative permanence, have come to form a sort of background to experiences that are relatively transient. As Seckendorf, in *Thorndale* (a sadly neglected book), puts it:—"His thoughts are the *I*, the *Ego* of the mature man. As consciousness develops, thought predominates over sense, and we are especially the thinking, remembering, anticipating being. . . . You and the child both hear the murmur of the brook. What a different *I* it is that hears! In the child the ear hears, and that is all; in you the murmur excites, and is related to, a hundred thoughts: it is this *hundred-thoughted I* that listens to the stream." The "*hundred-thoughted I*" certainly changes, and such change certainly involves identity as well as difference. To determine the nature of the identity is no doubt an important psychological problem. We may, indeed, cut the Gordian knot by picturing the manifold of difference as detached from an assumed identical nucleus, and as conjoined to the latter by a merely external tie; we may then proceed to erect this assumed nucleus into a quasi-substantive entity to which alone the name "*I*" or "*me*" is to be given. But, in so doing, we have simply been hypostatizing an abstraction and creating for ourselves fictitious problems instead of solving a real one. As a ground of

explanation, too, the assumption is valueless. Were it really the case that the mental states a_1, a_2, a_3 are produced by the activity of one identical entity A, that would in no way account for the *consciousness* of their unity. The psychological question as to the way in which unity of consciousness comes about would still require an answer, and the hypothesis we are considering would afford us no help in providing it. In fact, we should have on our hands a difficulty of precisely similar character to that which confronted us in the conception of the mind as a collection of mental states.

The truth is there is involved in the mental life a unity and continuity of quite unique and peculiar kind, and any image derived from material things is bound to lead astray. I have myself spoken of a "stream," and I acknowledge the inadequacy of the simile. We know material things only from the outside; we describe a thing as one and continuous if it appears to us one and continuous. Now, from the point of view of an external observer, a mental life need by no manner of means be one and continuous. From *that* point of view, it may well—it certainly would—exhibit gaps or pauses. And from that point of view, we shall always be flying to the assumption of a metaphysical ego to bridge over the gaps, to the assumption of a soul-substance which would look one and continuous if we could gaze upon it. But from the point of view of the conscious subject whose experience is in question, unity and continuity mean something very different. Take any momentary section of that subject's mental life. What do we find? We find, in the first place, as an empirical fact, difficult, if not impossible to account for, that what is experienced is always limited in range, that only a very small portion of what might be experienced actually is experienced. We find, in the second place, that within this limited area there is always a manifold of related elements, of elements, that is to say, the apprehension of which is only possible on account of their difference from and connexion with one another. Some elements of the apprehended whole will

probably occupy a more prominent and dominating position than the rest, and it will be relation to these central elements that will determine the degree of clearness and definiteness with which the rest will be apprehended, so that there will almost invariably be a margin or fringe consisting of features loosely and indistinctly connected with the dominating elements. We find, in the third place, that alteration in what is experienced from one empirical moment to another is only partial, never complete alteration. What happens is a more or less gradual modification of the totality at any specific moment. And we find, in the fourth place, that in what is experienced at any empirical moment there is always involved and implied a reference beyond itself,—a reference, it may be said, to the past and even to the future. In other words, we are here brought to the recognition of retention or revival as an essential and fundamental condition of any conceivable mental life whatsoever. Unless that which has formed the content of a present state of consciousness were capable of retention or revival in subsequent moments of consciousness there could be no apprehension of which we can form the remotest conception. I think psychologists, no less than philosophers—if they must be distinguished—are under a deep debt of gratitude to Dr. Shadworth Hodgson for the clear and convincing way in which, in analysing what he calls the “empirical present moment,” he has shown that “the very least and lowest empirical states of consciousness are cases of memory in the sense of retention,” and that retention of a past in a present moment is one of the ultimate facts of experience, being involved in the simplest forms of perception.* It is a fact, this, which is hardly yet fully realised in psychological work. Perception, imagination, thinking, desiring, willing,—all are based upon retention, and all alike would be equally impossible without it. There is not a problem of psychology that does not centre round the nature

* *The Metaphysic of Experience*, Vol. I, pp. 54–71.

of retention, and which would not appear in a new light were we in a position to say how retention and revival are effected. But of retention in its essence we have no psychological account to offer; we have simply to accept the fact itself as lying at the very root of mental existence. Look, now, at this fact from the outside, and you will begin to talk of "residua," and "traces," and "images" stored up in the regions of sub-consciousness, and of an unchanging ego, and conceive that in some inexplicable way you have thus solved the problem involved. Consider it, however, from the point of view of the subject experiencing, and these metaphorical phrases will evince themselves as one and all futile, and it will appear that you have here to do with that which has no parallel, nothing analogous to it, in material nature. This fact of revival or retention affords, too, the basis, or an indispensable part of the basis, on which the unity and continuity of a mental life really depend. Not a relation of all its states to an unchanging ego, to some entity different from each of its states and from all of them put together, but just the fact that through every one of its states there is a revival in part of what has been experienced,—a fact which means the absolute distinction of the states of any one mental life from the states of any other mental life,—this is a true ground and condition of a mental life's unity and continuity. Unity and continuity mean, then, a unity and continuity in *what is experienced*, or, as I should say, in the contents of successive acts of consciousness; they do not mean that the process of experiencing, as it would appear to a hypothetical outside spectator, would be unbroken in its course.

I have been using the phrase "mental life" because I could find no other phrase suitable for my purpose, and now I am prepared to defend what I have done by urging that the term "mental" is primarily and in its most fundamental sense applicable to an individual conscious life, one and continuous in the way I have been indicating, whilst "acts of consciousness"

are "mental" only as modes or phases of an individual conscious life. If there be any truth at all in what I have been contending, it is obvious that no "act of consciousness" can properly be regarded as possessing that degree of independence which would entitle it, for any but special purposes, to be isolated from the concrete whole of mental process to which it belongs, and to be treated as single in the sense of having its being in itself. It would follow that acts of consciousness are only acts of *consciousness* in virtue of the unity and continuity characteristic of their contents. By an abstraction of our own what we call one "act of consciousness" may, it is true, be distinguished from others and contemplated as a unit, but such an abstraction seems to me mischievous if it lead to the conception of a mental life as an aggregate of parts connected by relations of a merely external kind. Upon such a supposition mental growth and development cannot be rendered intelligible. Moreover, the arbitrariness of the distinction we make between different phases of mental process becomes at once apparent so soon as the question is pressed—on what ground do you decide that any so-called "act of consciousness" is rightly described as *one* act? Save the ground of practical convenience, I know of no answer that could be given. "A process of reasoning," says Mr. Moore, "is not itself a 'mental act'; it consists of a number of different mental acts, combined together in some particular way." But why is it not *a* "mental act," and how am I to determine the number of "mental acts" of which it consists?

The conception of the mind as a continuously developing mental life stands, in truth, in much more decided antithesis to Hume's theory of the mind as a collection of mental states than does the conception of a subject as distinct from these states and as affording a bond of union among them. For the latter conception results from conceding Hume's point that mental states would be "entirely loose and separate" did they not "inhere in something simple and individual," whereas the former conception amounts to a direct

denial of that contention. A continuously developing mental life and a mechanical aggregate of parts present probably the strongest contrast discoverable within the world of real existence. It is, then, one thing to say that the conscious subject *is* its states; it is quite another to say that a sum of states is the conscious subject. If, biologically, it be an error to describe a living organism as an aggregate of living cells, one might expect it to prove, psychologically, a still greater error to describe a conscious mind as an aggregate of psychical units. And if it be asked what more is the mind than such an aggregate, the reply is that since it has first got to be an aggregate before it can also be something more, the question is meaningless. At every phase of its development, the conscious subject is, in other words, an organic unity, a unity which develops as a unity and which the several changes as they proceed differentiate and render more complete and real. The mental life is *one*, not as an aggregate of separable parts, but as exhibiting a series of internal changes of the subject that experiences in and through such changes. The conscious subject is an *individual* subject, because its nature is such that in all its several states or phases it is aware of itself, aware of itself not necessarily *as a self*, but aware of all it is aware of in a manner which we, for want of a better expression, can only describe as a mode of "being for self." From the point of view of the experiencing subject, there is a *unity of awareness* which indicates a oneness of nature on the part of the mind in question. That, however, does not mean that the mind is first made and then provided with material to apprehend. It means, rather, that the process of formation is a process of getting such material, a process of developing apprehension of objects. I think, therefore, we are entitled to say, with Adamson,* on the one hand, that the self-consciousness of mature experience could never have arisen if the primitive and

* *Development of Modern Philosophy*, Vol. II, p. 58.

rudimentary states of mind had not, as essentially belonging to them, this obscure self-reference; and, on the other hand, that neither the primitive self-reference nor the matured self-consciousness indicates a factor distinct from the mental states themselves.

I add a word about the remaining view referred to by Mr. Moore, and against which he can find nothing conclusive,—the view, namely, that the entity which hears and sees and feels and thinks may be the body. I am not sure how Mr. Moore intends this to be interpreted. Reference, however, is made to Locke. Locke speaks of the possibility of “a faculty of thinking” being superadded to matter, and I presume that is not what Mr. Moore means. Yet Locke’s awkward and hesitating mode of expressing himself does suggest a line of reflexion upon what Mr. Moore has said. The hard and fast line usually drawn between the psychical and the corporeal can hardly be maintained in face of the overwhelming evidence pointing to their close connexion. We tend habitually to represent to ourselves the succession of neuro-cerebral changes and the succession of mental states as two independent series of events:—

$$\begin{array}{ccccc} & A & - & B & - & C \\ & | & & | & & | \\ \alpha & & & \beta & & \gamma \end{array}$$

A, B, C we picture as a series of physical, α , β , γ as a series of psychical, events. The two series we suppose to go on concomitantly, and to be in some mysterious way in correlation, but, so far as causal relatedness is concerned, we take A to be exhausted in B, and to have, therefore, no opportunity of causing α ; and, similarly, B to be exhausted in C and to be precluded from causing β . I am not going, of course, to discuss Psycho-physical Parallelism, the scientific form of this popular mode of representation. The difficulties of the doctrine are obvious and acknowledged even by those who use it as a convenient working hypothesis. Equally as regards it and the

theory of interaction, I think it legitimate to raise a prior question,—whether, namely, we are really entitled to speak of α , β , γ (or, for a matter of that, of A, B, C) as a distinct series of events at all; whether, in short, we are not in error in looking upon the body and the mental life as belonging to two separate realms of existence which are somehow brought into combination. Why, in other words, should we not conceive the real process of existence, the real sequence of events, in the case of what we call a conscious being, to be rather of the form $A\alpha$ — $B\beta$ — $C\gamma$, where each event of the series would be neither wholly physical nor wholly mental, nor a mere mechanical juxtaposition of the two, but an occurrence in which both factors are mutually implicated and involved? It is quite true, as indeed Locke points out, that we can neither describe the qualitative peculiarity of an act of consciousness in terms of a mechanical arrangement of material particles, nor in any way imagine the latter as giving rise to the former. But this inability indicates in itself nothing exceptional; everywhere in nature the process of real change confronts us with a similar impossibility. Take a specific quantity of the two gases, hydrogen and oxygen, combine them in certain proportions, and you obtain water. Yet by no stretch of imagination can you see, as it were, with the mental eye, the qualitative nature of water—its fluidity for example—gradually being constructed through the mere putting together of the two chemical elements. The truth is, of course, that water is not merely H_2O , but is only real as characterised by qualitative peculiarities of a definite and distinctive kind. And, as we ascend to the more complicated processes of what we call material existence, the same truth is illustrated still more strikingly. If protoplasm be the physical basis of life, it is, I should say, certainly mainly on account of its qualitative character that it is so, and not simply in virtue of that aspect of it which finds expression in terms of mere mechanism. I know, then, of no reason why we should not say that the brain or the bodily organism is conscious, just as we say that water is fluid

or that protoplasm is alive. There is no more difficulty in supposing the consciousness of blue to be an adjunct of a certain configuration of material particles than in conceiving blue itself to be such an adjunct. Only I do not see why I should be any the less a mental entity because I am also something more. Just as it is not inert but moving matter that moves, just as it is not inorganic but organic matter that lives, so it would not be mindless but mentalised matter that is conscious. In other words, we should be simply saying, as Locke did say, that to a highly complex system of material configurations there is superadded the qualitative nature of consciousness; we should in no way be making the one a product of the other. Instead of treating acts of consciousness as so many events to be accounted for, we should treat them exactly as we treat other qualitative determinations, and accept the fact of their mechanical accompaniments in quite the same way as we accept a similar fact in reference (say) to the quality blue. And inasmuch as we cannot represent the mechanical configuration as part of the content of what, on the basis of the more primitive unity of conscious experience, we come to be aware of as the self, we should still be justified, as psychologists, in dealing with the mental life as it presents itself from within, and in trying from that point of view to decipher the laws according to which its growth and development take place.

Along the path just indicated we should be led back, in a sense, to the earliest scientific attempt to treat the mental life as a special topic. In the *De Anima*, Aristotle consistently regards mental activities as falling into line with the processes of animal life, and conceives of them as in the closest relation to bodily changes. It is possible that psychology has been too much influenced by the Cartesian tradition and its sharp antithesis between the mental and the material, between consciousness as the essence of the one and extension as the essence of the other, and that the science may yet become

more concrete, more faithful to actual fact, by a return with newer insight to the larger view of the Aristotelian philosophy.

II.

If any two mental acts differ in respect of the fact that, whereas one is a consciousness of one entity, the other is a consciousness of a different entity, *also* differ in respect of some difference of "content," then, maintains Mr. Moore, the difference of "content" would undoubtedly be a mental entity, and a mental entity in the same sense in which the quality which differentiates belief or volition from mere apprehension is a mental entity.

It must be admitted that Mr. Moore is here expressing the general view in so far as he asserts that a difference of content, if there be such, would be mental, but not, I think, in so far as he goes on to say that it would be mental in the same sense as the quality which differentiates volition from mere apprehension. The Herbartian psychologists, to whom we owe in modern times the introduction of the distinction between act and content, certainly did regard the content of a mental act as mental, but they certainly did not regard it as mental in the same sense as the difference which distinguishes a belief or a volition from mere apprehension.

I am doubtful how far Mr. Moore and I include under the term "content" the same entities. I believe I am using the word with the denotation ordinarily given to it, although doubtless, as I do not agree with the ordinary view that the entities denoted by the term are necessarily mental in character, the connotation will be different. It may be well, at the outset, to refer to two recent writers who have laid emphasis upon the distinction.

Professor Lipps has laboured persistently in various articles of his* to work out a doctrine that does not differ greatly from

* See especially, Theodor Lipps, *Inhalt und Gegenstand*, 1903; *Psychologische Untersuchungen*, Bd. I, Heft 1, "Bewusstsein und Gegenstände," 1905; Bd. I, Heft 4, "Die Erscheinungen," etc., 1907.

that of certain English writers. In sense-experience, he argues, three aspects call for recognition,—the subject experiencing, the sensation as a state of the subject, and the content of the sensation or the *sensum*. *Empfindungsinhalte* are images (*Bilder*) actually present in consciousness as *Bewusstseinsinhalte*. They, and the *Vorstellungsinhalte* corresponding to them, are to be sharply differentiated on the one hand from feelings and on the other hand from the consciousness of objects (*Gegenstandsbewusstsein*). I can say of them, as of feelings, that I “have” them, but I have them as something different from me, whereas I am my feelings, or in my feelings experience myself as in a certain manner determined. A content of sensation is, in fact, that which is immediately experienced on the occasion of stimulation; the sensation as a mental occurrence is a “having,” in the sense of being *ein rezeptives Erlebnis*, on the part of the subject. Thinking, on the other hand, is not a “having” but an act,—an act based, no doubt, upon the having of sense contents, but which consists in calling an object, not indeed in itself but for the subject, into existence. In the sense contents objectivity is implicitly involved, but through the act of thinking what is implicit is made explicit, and an object is recognised as standing over against, and as existing independently of, the subject. The blue which I experience as a content of consciousness and the blue which by “the mental eye” I simultaneously apprehend as an attribute of a thing resemble each other qualitatively in every particular, yet, in respect to *existence*, they belong to two wholly different worlds—the one to the world of subjective reality, the other to the world of objective reality.

The other writer I have in mind is Professor Witasek,* who is largely influenced by Meinong. Presentations (*Vorstellungen*)—including under that term not only the images of memory

* Stephan Witasek, *Grundlinien der Psychologie*, Leipzig, 1908. Cp. by the same author, *Grundzüge der allgemeinen Aesthetik*, p. 192 sqq.

and imagination, but also sensations and sensation-complexes—constitute, according to Witasek, the basis of the whole psychical life; all other mental products—such as thoughts, feelings, desires—are dependent for their existence upon presentations. Every presentation must, however, be regarded from two points of view,—it is at once a mental act and it possesses a certain content. The presentation of a water-drop differs, as a presentation, from the presentation of a flower. Neither the water-drop nor the flower are in any way part of, or contained in, the presentation; the object of a presentation lies altogether outside of the presentation itself. But although presentation and object are essentially separate and distinct—the one always psychical, the other very often physical—yet it cannot be said that they have nothing to do with one another. The presentation refers to the object, brings it into consciousness, is related to it, and the character of a presentation will partly depend upon the nature of the object to which it is related. That portion, then, of the presentation in virtue of which it brings a certain object to consciousness, Witasek names its content. The content, he insists, is invariably a part,—not, indeed, a separable part—of the presentation, and is, therefore, always psychical. Whether object and content resemble one another is, he urges, a question psychology is not called upon to answer. The presentative act is that part of the presentation in respect of which it resembles other presentations and differs from all that is not presentation, not only from everything physical, but also from those psychical processes, such as judgments and feelings, which are not presentations. Presentation, judgment, and feeling are fundamentally different psychical acts; the difference is a difference not reducible to a difference of content. And within the range of presentation itself there are differences, as for instance between a perception and an imagination, which are differences in the quality of the act and not merely of content.

These two ways of interpreting the significance of the term

"content" exhibit sufficiently marked divergencies, but they agree, at all events, in instituting a decided opposition between presentation and thought, and in describing the content of presentation as psychical. It is largely because the assumed generic distinction between presentation and thought seems to me untenable that I conceive the content of presentation is wrongly regarded as psychical.

If presentations are looked upon as so many separate, isolated affections of mind, in some way immediately experienced,—and that seems to be Lipps' view—then, doubtless, whatever "content" they possess must be, to use Mr. Moore's phrase, a mental entity. In that case there would be no resisting the conclusion that "the idea of the extended has extension, the idea of the heavy has weight, the idea of the odorous has smell, and the idea of pleasure exists and is so far pleasant." For "unless a thing has, and to that extent is, a quality," it is certainly pertinent to inquire "how it goes about to show it."* Nor can I see that the description of the "content" as "part" of the presentation in any way helps us to escape the admission of what would seem to be a necessary consequence of regarding the content as psychical.† In a manner that recalls a well-known argument of Berkeley's, Mr. Bradley endeavours to meet the objection that the soul itself must be extended if its states are by answering that what the soul is itself, as a whole or directly, and what again it is indirectly and merely in respect of its parts are not to be confounded. And I suppose a somewhat similar mode of reasoning might be pursued with regard to a presentation. I can only say I do not envy the task of anyone who has this problem on

* F. H. Bradley, "The Intensity of Psychological States," *Mind*, N.S., vol. IV, 1895, p. 21.

† Perhaps, indeed, Witasek does not wish to escape the admission. At any rate, he speaks of presentations as "psychical images (*Bilder*) of objects with which our consciousness is occupied." Here he differs from Meinong.

his hands. I think he would be compelled to abandon the position that act and content are inseparable parts of a presentation, and to conceive of them as two essentially distinct and independent mental entities. The difficulty which comes here to the front is precisely that with which Meinong is struggling when he finds himself forced to draw a three-fold distinction between act, content, and *immanent* object. It is, indeed, excessively hard to make out what exactly Meinong himself means by "content." Although presentations of different objects resemble each other as acts, they cannot, he argues, be wholly alike; however the relation of the presentation to its object be conceived, still the difference of objects must in some way lead back to difference in the respective presentations. The "content," then, is not the object, but "that wherein presentations of different objects differ from one another, notwithstanding the identical nature of those presentations as acts." The content exists and is psychical, whilst the object presented through means of the content may be non-existent, unreal, something that has existed or will exist but does not now; it may be physical and not psychical. Where the object is popularly said to exist only in idea, it is still as "immanent object" to be sharply distinguished from the content (for the same object, though it be immanent only, may be presented in and through different states of mind), but it cannot in strictness be said to exist; at the most we can ascribe to it what may be called pseudo-existence. Whether Meinong means that an "immanent object" is always involved in apprehension, even when a transcendent object is present, is not clear to me, but taking into account the emphasis he lays upon the phenomenal character of what is perceived, I should imagine that to be his view. But, in any case, it cannot be denied that, in spite of Meinong's careful and elaborate analysis, the antithesis between immanent object and content is beset with obscurity. The content, he tells us, tends to pass into the background in favour of the object, and, there-

fore, on his own showing, it is diversity of object and not diversity of content that distinguishes one presentation from another. Meinong, it is true, insists that although not easy to detect the content may still be discerned. "The qualitative peculiarity, which we experience when we see red, or think of red, belongs not to the object but to the content. And that we feel differently when we see now red, now green, is again to be traced not to the objects but to the contents. It is not, however, as though the content were in the one case the red, or even red, or the green, or even green. Red and green are simply not the contents, but what through the contents are apprehended." But when we are afterwards informed that "the same content may be capable of apprehending different objects," we appear to be landed in hopeless contradiction with the very principle from which we started.*

So long as presentation and thought are looked upon as totally disparate mental functions, the obstacles in the way of offering any intelligible psychological analysis of either process seem to me insuperable. That presentation and thought should be so often thus regarded is, I think, readily accounted for. Since in mature experience sense-data come before us as definite, determinate, clearly defined individual facts, in coexistence or succession, and since *we* can consider those facts separately and then put them together and recognise their similarity or difference, the tendency to take this as corresponding to the order of genesis in the development of cognition is well-nigh irresistible. And it needs but another step to assign the apprehension of the distinct independent sense-data and the recognition of similarities or differences amongst them to two special and unique faculties of mind. Not all that Meinong has to say respecting the absolute distinction between presentation and judgment, not all the

* A. Meinong, "Ueber Gegenstände höherer Ordnung," *Z. f. Psych.*, XXI, 3 and 4, 1899, p. 185 *sqq.*; "Ueber die Erfahrungsgrundlagen unseres Wissens," 1906, especially p. 58 *sqq.*

stress he lays upon the *a priori* character of such judgments as the judgment "red differs from green," convinces me that we have in the view itself a really sound psychological hypothesis. The necessity for the explanation he has to offer of the non-empirical elements in knowledge comes from the arbitrary severance which has been effected between completely formed presentations on the one hand and the abstract relations supposed to be recognised by the higher activity of thinking on the other. The consideration is lost sight of that, from the point of view of the apprehending subject, what are called presentations of colours, sounds, odours, and the like, as they come before us in mature experience, may be highly evolved products and as such presuppose a long prior exercise of that very process of thinking which is now regarded as an activity superinduced upon them and using them as the material of its operation. Psychologically it is simply impossible to take any piece of the experience of a developed mind, and to apportion which constituents in such experience are directly, immediately apprehended, and which are introduced by the discursive procedure of thought. And it is impossible because, however carefully we may single out the elements obviously involving reflective thinking, we have no guarantee whatever that the remainder,—a distinct and definite sense-datum, let us say—would be a possible object of apprehension for a consciousness that had not been repeatedly using abstract notions or concepts. That is to say, the presentation of a simple quality, as it occurs in mature experience, is never a simple act of mind. Strip from it, with the utmost nicety, every feature that seems foreign to its nature, and it will still be true that the mind whose presentation it is, is a reflective thinking mind,—a mind that, strive as it may, cannot divest itself of the facilities it has acquired in the course of its history, and whose acts of presentation, therefore, will be interpenetrated with the results which reflective thinking has brought about. Expressed in another way, what has just been said amounts to this. Experience does

not begin with the awareness of separate, distinct, definite sense-data. How isolation, independence, definiteness in the world of sense apprehension come gradually to recognition, how the vague, chaotic, indeterminate whole of primitive experience gradually breaks up into determinate and clearly distinguished sense qualities, is the main problem which genetic psychology has before it. When that problem is fairly faced, when the effort is seriously made to trace the lines along which the development of cognition proceeds, I think it is evident that the assumption of mere passive receptivity, so far as what is ambiguously called sensation is concerned, must be relinquished. Advance in cognition will, I think, be found to take place through a continual process of differentiating and distinguishing features which, although present in reality, are not on that account forthwith accessible to a mind that happens to stand in contact with them. I conceive, then, that not even the crudest apprehension of sense-data can be accounted for as a fact of mind except it be viewed as a process of discriminating and comparing,—a process which, whilst differing, of course, vastly in degree of completeness from those acts which we specifically describe as acts of comparing and relating, yet is in kind identical with them. The presentative act is, that is to say, from the beginning, in essence an act of judgment, although the term judgment, as ordinarily understood, indicates far too developed a form of the one common process to be rashly employed in reference to the earlier phases of the process. What I am trying briefly to say would be very inaccurately expressed by the familiar contention that “judgment enters into perception just as truly as sensation does.” Rather what I am concerned to maintain is that cognition, from its most rudimentary to its most evolved stages, is throughout fundamentally the same in character, that mental development does not involve the introduction of any absolutely new factor, that the earliest mode of sense presentation and the highest modes of thinking are genetically connected and

generically alike. If, then, it be recognised that the elementary functions of discriminating, comparing and relating are involved in apprehension from the outset, there is nothing to be gained by extending unduly the use of the term "judgment." It is only in comparatively late stages of the history of mind, and in consequence of the varied material with which apprehension can then be occupied, that sense apprehension and thinking come to be held apart and to present the aspect of two disparate mental faculties.

The consideration I am urging may, perhaps, be restated in some such terms as these. Whilst it is possible to offer a more or less consistent psychological account of how gradually presentations come to have for the conscious subject the appearance of isolated independent facts upon which an additional operation has afterwards to be performed in order to bring the said facts into relation, it is *not* possible to offer any psychological account either of an act of simple apprehension or of an act of discrimination if it be assumed that these two are really and primordially distinct and separate functions. When, for example, we observe two colours, A and B, of a similar kind, and not only apprehend each for itself, thus holding them apart, but pronounce them to be like one another or different from one another, it is obvious we are using *notions* of likeness or difference—*notions* which are not explicable by reason of the mere presence of A and B alone. It is not part of the content of A that it is like B, or different from B; it is not part of the content of B that it is like A, or different from A. And if it be said that the presentations of A and B, having respectively occurred, give rise to the new idea, C, of their likeness or difference, the language employed does no more than conceal the want of explanation in what is said. A, it is assumed, may be simply apprehended; B, it is assumed, may be simply apprehended. If, however, the question be pressed, what then is it that takes place when A and B are somehow held together in an act vaguely called

an act of comparison, and gives rise to the new idea of their likeness or difference, the predicament confronts us of being able to explain neither the holding of A and B together nor the way in which the new idea of likeness or difference originates. We shall find ourselves simply falling back upon the perfectly barren assertion that it *is* the nature of the psychical mechanism to hold separate presentations together, and to produce ideas of relation automatically under such circumstances. But to assume that, at any period in the life of consciousness, ideas of relation spring up *de novo* when presentations, already clearly and distinctly marked off from one another, are somehow compared and brought into connexion is, I submit, to assume a wholly inexplicable mode of behaviour on the part of what we call the mind. We could know nothing whatever about the assumed occurrence save the result to which it was supposed to give rise; we should simply be reiterating in our imaginary explanation the very features we were seeking to explain. Naturally, therefore, the inquiry is forced upon us whether the *impasse* before which we are thus brought to a stand ought not to be attributed to a perverse way of framing the problem; whether, in fact, we have not rather created a new and insoluble problem than solved one that really requires solution. Naturally the inquiry is forced upon us whether distinct *ideas* or *notions* of relation, instead of being mysteriously thrown up by a specific and mysterious mental act, are not, in truth, products which a long course of mental evolution has rendered possible; and whether the apparent separateness of the act of discriminating from the content discriminated is not due, in part at least, to the employment of such ideas of relation when at length they are formed. Presented in this shape, the problem opens out, at any rate, a fruitful field of psychological investigation. We may not be, we certainly are not, in a position to furnish an exhaustive analysis of all the factors involved, but we shall be able to retrace in a general way the steps by which the relations would

gradually come to be conceptually separated by the apprehending subject from the related contents and, in being contemplated in and for themselves, inevitably to wear the aspect of being more specially dependent upon subjective function than the elements related. A regressive procedure of this kind would lead us back, that is to say, to rudimentary and primordial acts of discrimination, not involving either self-consciousness on the part of the apprehending subject or recognition, say, of differences as aspects separable from the facts that differed. In other words, the only way, so far as I can see, of rendering psychologically intelligible the elaborate act on the part of a mature mind which Lotze calls an "act of relating" is to view it as a later and higher stage in the process of discrimination—a process which, in the course of its development, will exhibit the most varying degrees of complexity, but which will preserve throughout a generic sameness or unity of character. Following this regressive method, we should have discrimination evincing itself in ever simpler and more rudimentary forms. There would be no avoiding the conclusion that to discriminate contents does not necessarily imply even the faintest recognition of what may be said to be implicit in the act of discriminating, namely, the *idées* of relation themselves. To distinguish A from B at all—be it in the vaguest, crudest, and most indefinite manner imaginable—would necessitate doubtless the exercise of a process that under suitable conditions was capable of developing into an act through which the relation might be contemplated in abstraction, but it would not necessitate at the outset the remotest apprehension of such relation as distinct from the related facts. In other words, one is ascribing to the rudimentary consciousness nothing but the barest minimum of what can be called experience. The simplest phase of the inner life, the first dim obscure awareness of a sense quality, may, then, be described without incongruity as in this sense an act of discriminating—an act depending on the presence of

material to be discriminated, but differing wholly from a mere reaction to impression. From the beginning, the material discriminated would be objective fact, although not recognised as such; what was in, or of, the mind, in the sense of being part of the mind's structure, would be the act of discriminating the material.

I have thus, I hope, prepared the way for what I am now concerned to maintain respecting the distinction between object and content. Apprehension, as a process of discriminating, is confronted with a reality infinitely rich in qualitative variety and detail. We know, as a matter of empirical fact, that the range and scope of the mind's discriminative capacity are continually altering. Every increase of knowledge, as I conceive it, just means an increase either in the features discriminated, or in the more accurate determination of the part played in the realm of nature by those already discriminated. Advancing knowledge might be likened to a pattern gradually coming out, or to the gradual emergence from the night, in which all cows are black, to the dawn, in which their colours are visible. Only the process is never completed; there is always more to come out; there is always, in reality, a vastly greater amount of detail than our limited powers of discriminating are capable of discerning; there is always a more elaborate network of connexions than we have been able to trace. In all stages of the development of apprehension, the contrast between what actually has been discriminated and the more remaining to be discriminated holds. What we, in mature experience, familiarly differentiate as sense perception and thought advance, in this respect, along parallel lines. Sense perception and thought are not, I have argued, two disparate functions. As modes of mental activity, they are fundamentally alike in kind, the broad obvious differences with which we are familiar being differences mainly dependent upon what in each case is apprehended. Sense perception, in its more primitive form, certainly precedes

in order of genesis the operation of conceptual thinking, yet when once a conscious subject has become capable of conceptual thinking, sense perception itself no longer continues to be what it was. With the acquirement of general notions, the facilities for perceptual discrimination cannot but be immensely furthered. Psychological analysis has abundantly shown it to be through the help of thoughts or concepts that perceptual discrimination works its way to the apprehension of individual objects, a mode of apprehending with which we are all too prone to imagine experience begins. Experience, starting from what in strictness can be described as neither individual nor general, gradually attains, by means of rudimentary judgments, to notions of individual objects possessing general characteristics and standing in relations expressible only in general terms. Discrimination, that is to say, can proceed but a comparatively little way without the aid of generalisation. Indeed, every discrimination, even from the first, may be said to furnish the basis for what in the course of subsequent development will take the form of a judgment, the subject-term of which will denote the individual and the predicate some general or universal feature. Mere presentative experience, if such a phrase is permissible at all, must be taken to mean experience that involves the least possible amount of discrimination, and consequently the least possible amount of cognitive apprehension. In the light of this consideration, the dictum of Leibniz that sense is confused thought may be interpreted so as to convey an important truth. Sense perception certainly does not reach the stage of clearness and distinctness until it takes the form of an act of judgment. Even then, the span or compass of apprehension in sense perception continues to be more or less limited to what is in immediate connexion with the sense organs, and to what is momentarily stimulating the sense organs. Within its own field, however, there is effected by sense perception a progressive differentiation of the features of individual objects—a progressive recognition of

their multiplicity of detail. Let me use, by way of illustration, Dr. Ward's account of what happens when, in the course of a few minutes, we take half-a-dozen glances at a strange and curious flower. "We have not as many complex presentations which we might symbolise as F_1, F_2, F_3 . But rather, at first only the general outline is noted, next the disposition of petals, stamens, etc., then the attachment of the anthers, form of the ovary, and so on; that is to say, symbolizing the whole flower as $[p^1(ab) s^1(cd) o^1(fg)]$, we first apprehend, say $[p^1 \dots s^1 \dots o^1]$, then $[p^1(ab) s^1 \dots o^1]$ or $[p^1(a \dots) s^1(c \dots) o^1(f \dots)]$, and so forth."* And, far as perceptive discrimination may proceed, the antithesis between the infinite wealth of detail in the real object and so much of that detail as is apparent to the apprehending mind will remain. A similar antithesis presents itself no less manifestly in the higher activity called specifically the activity of thinking. Concepts may be said to be based on the resemblances which perceptive discrimination discovers in the order of experience. Roughly speaking, the concepts of discursive thought result from the reflective treatment of a multiplicity of concrete individual objects that exhibit, amid variety of circumstance, the same kind of determining characteristics. By the ignoring of a mass of sensuous concomitants, irrelevant for the purpose in hand, the span or compass of consciousness in the activity of conceiving is indefinitely extended, as compared with the span or compass of consciousness in sense perception. Great stretches of the real world in space and time are focussed, so to speak, in one view, common features which in reality present themselves as parted, perhaps widely, in time and space, and as imbedded in a host of detail, are extracted from that detail and singled out and known for what they are. What thought thus loses in respect to empirical material is compensated for by range and depth of comprehensiveness. At the same time, thought retains throughout, notwithstanding its mediate

* Art. "Psychology," *Encyclopædia Brit.*, ix ed., vol. xx, p. 47.

character, the most distinct reference to objective fact. This or that individual instance may be left out of sight, but to leave all individual instances out of sight would be tantamount to converting the concept itself into another individual, and to commit the blunder of hypostatising an abstraction. Both in sense perception and in thought, it seems, then, to me, there is a perfectly legitimate contrast to be drawn between the content of an act of apprehension and the object of that act of apprehension. The object may be either immediately or mediately apprehended, but in either case those features of it which are discriminated, and of which therefore there is awareness, will be at the best but a fraction of the totality of features of which the object itself is composed. The content of the act of apprehension will be the sum of qualities actually discriminated in and through the said act,—a sum of qualities whose being, *as a sum*, has come about through the act of apprehension, and which will be different from the *sum* of features composing the object. Could some god be induced to transform, by a creative fiat, the sum of qualities in question into an existent object, whilst at the same time annihilating the act of apprehension in and through which alone as content merely it has being, then to that god's observation the newly created object would be by no means a reduplication of the original object. Were the god further induced to annihilate the original object and to substitute in its place that which he had just called into existence, then as a constituent of the inter-connected realm of existence, the latter object would not play the same part as the former. As content, however, of an act of apprehension, the sum of qualities we are considering has no separate existence; it is there as defining or specialising the act of consciousness of which it is the content. The content, again, may be, and no doubt often is, hypostatised, and treated as an object. But the content is not rightly treated as an object. In strict accuracy, it is not that *of* which we are aware; what we are aware *of* is the real object. The content is rather the

way in which there is awareness of the object, the way in which the object is known. In short, the content is our knowledge of the object, as distinguished on the one hand from our knowing, and on the other hand from that which is known. If we ask, *what* do we know of the object, the answer will be in terms of the content; if we ask, *of* what do we know, the answer will be the real object. So, too, the varying relations in which, from the point of view of the apprehending subject, the content stands to the object becomes explicable. In sense perception, where the object is being immediately discriminated, content and object will seem to fall together, and the distinction will tend to escape notice; in thought, where the object is being mediately or reflectively discriminated, the content will tend to become hypostatised and to usurp the place of the object. But, so far as the nature of the content, *quâ* content, is concerned, I fail to discern justification for supposing that there is any difference *in kind* between the contents in the two cases; in both the content would be wrongly conceived if regarded as possessing an existential character, in neither would the content be rightly conceived as occupying the position of a *tertium quid* between the object and the knowing mind.

The distinction between content and object, as thus drawn, coincides in large measure with the familiar distinction between appearance and reality. Certainly, as I view the matter, there may be realities that are not objects, and there may be contents it would be misleading to call appearances, but, for the present, we can leave these out of account. It is, I take it, the cardinal error of those theories of cognition that have followed more or less the Kantian tradition to use the term "phenomenon" or "appearance" as though it involved the predication of existence, as though it involved distinction from the real in the sense of being one fact set alongside another fact. That, if the foregoing analysis be so far on the right lines, the term "phenomenon" does not involve. As contrasted with the richness, the fulness, the completeness of real existence, the term "pheno-

menon" carries with it rather the significance of fragmentariness, of incompleteness, of mutilation—peculiarities that point to the abstraction characteristic of apprehension in all its stages. The tendency to hypostatise abstractions dogs the steps of human thinking much more persistently than is usually supposed; constantly our thinking is prone to attribute to the phenomenal contents of acts of apprehension a fictitious existence, and to create baffling perplexities for itself thereby. And as against that tendency, one is entitled, I think, even on psychological grounds, to press the contention that the phenomenal is a way in which reality is known, that we know the real in and through its phenomenal appearance, that the appearance of a thing as contrasted with its reality indicates in truth a partial view of the thing as contrasted with the thing in its entirety. I should be prepared, I confess, to carry the contention further. It would be argued by thinkers of the Hegelian school that the fully developed content would be identical with what is here called the object. Could this thesis be sustained, Hegel's idealism would rest on a firm basis. But the thesis, I am convinced, cannot be sustained. The content belongs to the realm of knowledge, and knowledge, however perfect, of an existent fact can never *be* that existent fact, since it presupposes the existent fact as a condition of its possibility. The antithesis between knowledge and the known admits not of being transcended, because in the very nature of knowledge itself that antithesis is involved. The antithesis, however, implies no inherent defect on the part of knowledge. Exhaustive knowledge of a thing would be obtained if the thing's qualities, properties, and relations were completely discriminated, but the thing's existence is not merely the totality of its qualities, properties, and relations. It is true that the thing does not exist independently of its qualities, properties, and relations; it is equally true that it is excessively difficult to express in terms of knowledge what a thing's existence implies over and above its qualities, properties, and relations.

Exhaustive knowledge would include, no doubt, a solution of that problem also. But even then, and one might say in as much as in order to be known a thing's existence must be distinguished from its qualities, properties, and relations, the concept of its existence would not, and could not, *be* its existence.

Contents of apprehension, or phenomena, as thus distinguished from real existing things, may legitimately enough be said to be mental constructions—products, that is, of mental activity. Yet it does not on that account follow that they are mental entities. Consider those contents which Mr. Moore calls sense-data. Were a red colour, for example, “an ‘appearance’ of an act of consciousness” (p. 40), then, doubtless, it would be an entity rightly described as mental, although, even in that case, as Mr. Moore points out, the appearance would be very different from the reality, and would not be mental in the sense in which an act of consciousness is mental. It would, however, be mental in the sense that its *nature* or *mode of being* was derived from, or emanated from, mind. But if the red colour be not “an ‘appearance’ of an act of consciousness,” if it be an appearance of a real object, the features of which are discriminated by the act of consciousness, then I can find no reason for describing the red colour as in nature mental. The red colour could not, it is true, appear unless there were some reality such as consciousness to which it appeared, but it is equally true that there could be no appearance to consciousness unless there were a reality that appeared. The discriminating, in that case, is the work of consciousness; the red colour discriminated is supplied not by consciousness, but by the object of consciousness. On the other hand, I should not consider that the red colour as content of an act of awareness,—in abstraction, that is to say, from the physical object of which it is a quality—is rightly called physical. Nor do I think there is any occasion to shrink from admitting the conclusion to which we should thus be led. For after all, there

is, in truth, no ground whatever for the assumption that the universe of what Mr. Moore calls entities can be exhaustively divided into mental and physical entities, and we have here, if I mistake not, a class of entities that belongs neither to the one nor the other of these heads.

This position with respect to sense-data differs from each of the alternative positions in regard to which Mr. Moore feels himself unable to come to a decision. He is hesitating, if I correctly understand, between two views, neither of which seems to me to be tenable. On the one hand, he appears to say, it may be true that sense-data are non-mental, and in that case there will fall to be considered simply the act of awareness and the object of which there is awareness. The awareness, that is to say, will be definable in terms of itself, and altogether independently of that of which there is awareness. I think this view breaks down in the face of obvious facts. Apart from the circumstance that no account whatsoever can be rendered of an act of consciousness save simply that it is an act of awareness, awareness being taken in a quite general sense, the serious difficulty seems to confront us of being precluded from offering any intelligible interpretation of mental growth and development. And that is not all. Difficulties meet us at almost every turn, even in dealing with mature apprehension. For example, the varying appearances of one and the same object have to be explained in a manner scarcely to be pronounced satisfactory, whilst the relation of the object to the act of consciousness when the latter is an act of memory or imagination has to be left, so far as I can see, without any explanation. On the other hand, Mr. Moore appears to say, it may be true that sense-data are mental, although not mental in the sense of being acts of consciousness, nor in the sense of being qualities of acts of consciousness, nor in the sense of being related to me in the same manner as my acts of consciousness are related to me. I am not sure in what other sense precisely Mr. Moore

thinks sense-data may be mental. Apparently, however, there are two possibilities. (a) A sense-datum may, I presume he would say, be an "appearance" of an act of consciousness, or, otherwise expressed, a sense-datum may be a quality or property conferred upon the object, or added to the object, by consciousness in and through the act of apprehending. In that case, the act of consciousness would be, at one and the same time, *both* an act of awareness *and* an act of introjecting upon what it is aware of a sense quality,—the sense quality itself making its appearance as part of that of which there is awareness. Clearly, if this be what happens, the latter of the two operations is essentially different from the former. For one thing, whilst the act of consciousness may, according to Mr. Moore's account of it, be aware of itself *as an act of awareness*, it evidently is not aware of itself *as giving rise to a sense quality*. Though the latter be one of the functions of such an act of consciousness, the sense quality makes its appearance, at any rate, unconsciously and automatically. It is proverbially hard to prove a negative, and I do not know that there is any means of doing so in the present instance. What, however, I think, one can insist upon is, that analysis of the factors involved in sense perception yields no confirmation of this manner of regarding it. The consideration that weighs with Mr. Moore I gather to be the following. It may be true, he urges, that "all the sense-data of which anybody is ever conscious are entities which *are* only so long as that person is conscious of them." Good arguments can, he thinks, be furnished for and against this contention, but none such as to justify a certain conclusion either way. Mr. Moore does not tell us what the arguments which he has in mind are, and I can only say that I have searched in vain for any that would lend a measure of probability to the proposition just quoted. (b) A sense-datum may be, I suppose it would be said, a response of the mind to impression or stimulation,—a response distinct from and other than the act of consciousness in and through which

there is awareness of it. Acts of consciousness would, in that case, be one group of mental entities, sense-data would be another and separate group of mental entities, and in sense perception there would be direct awareness of entities belonging to this second group,—entities which in truth would be mental, although they appear to be non-mental. Just as, according to the theory of judgment referred to above, ideas of relation were viewed as springing up automatically in the mind when presentations are somehow held together and compared, so, in like manner, according to this corresponding theory of sense perception, sense-data must be held to spring up automatically in the mind when the mind is acted upon by influences from without. This doctrine is sufficiently familiar, and I repeat not here the criticism I have pressed in previous papers. It lands us, I have contended, in a hopeless position before the problem of knowledge. But on purely psychological grounds it calls, it seems to me, for unreserved rejection. There is, I submit, no evidence entitling us to contemplate sensations as impressions upon, or reactions of, the mind; on the contrary, the moment we come to close quarters with that assumption, the more psychologically unworkable and embarrassing it turns out to be. It presupposes certainly an underlying conception of the mind as a substantive existence, distinct from each and all of its modes of activity,—an implication, it is true, that is generally ignored by those who treat "sensations" as mental entities. And it is responsible for the ascription to presentations of a quite illusory independence, which, as I have been trying to show, conceals from view the really important consideration,—the intimate connectedness and inter-relation among the contents of apprehension.

I believe, then, that along the lines I have been indicating the term "content" (not, I admit, a happily chosen term) expresses a distinction which it is essential to recognise in dealing scientifically with the facts of the mental life, and

which enables us to interpret those facts unencumbered by the perplexities that beset the paths left open by Mr. Moore. The baffling notion of a fundamental difference of kind amongst such operations or processes of mind as perceiving and thinking does not intrude and block the progress of psychological explanation. An intelligible and consistent account can be given of mental growth and development without recourse having to be made to the desperate expedient of postulating, as repeatedly occurring, the introduction or calling forth of new powers or faculties.

III.

"All these things I do (*i.e.*, see, feel, remember, think, etc.); and there is nothing more certain to me than that I do them all. And because, in a wide sense, they are all of them things which I do, I propose to call them all 'mental acts.'"

With this mode of justifying the use of the term "mental act," it is impossible, I think, to rest satisfied. Not only does it ride, as doubtless was intended it should, rough-shod over perhaps the most crucial problem of general psychology, but the excessively ambiguous expressions of ordinary speech to which appeal is made, are laden with implications that ought surely to be avoided in attempting the somewhat ungrateful task of determining what shall be understood by the phrase, act or state of mind. Walking, speaking, writing are "all of them things which I do," but that hardly entitles them to be called "mental acts," and in the relation (whatever it be) which they bear to the "I" there is scarcely to be found a helpful analogy to the relation of seeing, feeling, and thinking to the self that sees, feels, and thinks. But, apart from this mis-giving, I would urge that such familiar phrases as *I* see, *I* feel, *I* think, etc., are popular ways of describing experiences of a highly complex kind—experiences which may, therefore, have nothing corresponding to them in the earlier phases of the mental life. Even supposing, then, that the experience

denoted by these phrases can be taken as trustworthy reports of what actually takes place in the mature mind—even supposing, I mean, that the self-conscious subject is, in some measure, aware of the psychical mechanism through which the experiences he describes as experiences of himself doing something are brought about—still, if so much be granted, to take what is specific to acts of consciousness of this developed type and to argue from it to the nature of an act of consciousness generally would be a precarious mode of reasoning. Throughout his paper, Mr. Moore uses the terms "mind" and "person" as though they were synonymous, and in one place expresses doubt as to whether or no there exist "acts of consciousness which are *not* the acts of any person."* The mental acts of the entire animal world, from the Protozoa to the Mammalia below the genus *Homo*, seem for the moment to have escaped his notice! The objection, at all events, requires to be pressed, that to narrow an inquiry of this generality to the mental lives of self-conscious persons is an important error. That done, the consequence is well-nigh unavoidable, that much will be mistaken for simple and ultimate, which in truth is a complicated product of mental evolution. I confess to feeling that the excellent work of Meinong and his associates suffers not seldom from the defect to which I am now alluding.

Following out the line of reflexion just indicated, I should maintain that into the description of a state of mind as a "mental act" there ought to be imported no implication of an assumed self or ego operating, as an agent, in some way behind the scenes, and manifesting its nature in a state or act exhibiting the same characteristics. And on similar grounds I should dispute the propriety of implying by the term "act of consciousness" the possession on the part of consciousness

* The above was written and in type before I saw the revised form of Mr. Moore's paper. Here, and in other places, he has, I observe, now substituted the word "mind" for "person."

of a power of exerting force, or of trying to conceive of such act as a "form of energy." The reasons I find conclusive against these implications are many. It will suffice here to refer to what follows, as it appears to me, from the position laid down by Mr. Moore at the outset, that "in every case there is always a distinction between that *of* which we are conscious and our consciousness of it." No one questions, of course, the fact of experience to which reference is made in such phrases as "sense of effort" and "consciousness of activity." What one may, however, legitimately question is whether the "effort" or the "activity" *of* which we are, in certain experiences, conscious is not to be distinguished from our consciousness of it,—whether, in other words, we may not say of "activity," what Mr. Moore says of a red colour, that it "is certainly not an act of consciousness in the sense in which my being aware of it is," and that even if it be an "appearance" of an act of consciousness, yet still "the appearance is very different from the reality." I, at least, can discover no valid argument for ignoring this principle in the one case, whilst insisting upon it in the other. Activity when experienced is, it seems to me, as much an object of consciousness (in Mr. Moore's sense of that phrase) as a red colour, when experienced, is an object of consciousness, and if a fundamental distinction is to be drawn between a red colour and the consciousness of it, consistency requires, I think, a like distinction to be drawn between activity and the consciousness of it.* Sense-data are equally involved in both experiences,—visual presentations in the one, motor and muscular presentations in the other—and a precisely similar question as to the mental or non-mental character of these data may be raised in reference to the latter, as is raised in reference to the former. It is quite true that the whole fact—the consciousness of activity—is far

* Is not Mr. Moore virtually admitting this in what he says (p. 38) about passivity?

too complex in nature to be resolved into the awareness of motor and muscular presentations alone. Just as the perception of a physical object implies a multiplicity of factors other than the directly apprehended sense-data, so also the consciousness of activity implies, in addition to motor and muscular elements, a multiplicity of other factors the presence of which can be explained only when account be taken of the history of mind. Our awareness of activity evinces itself, psychologically regarded, as the result of a long repetition of experiences, and as having acquired an appearance of simplicity and directness such as disguises from us its really complicated character. One can understand also why the activity we thus apprehend should appear to us as the putting forth of energy on our part. The experiences that result from movement of the body and its limbs are relatively regular and uniform in character as compared with the indefinite variety of presentations that follow as their consequences, and thus provide one basis at least for the gradual recognition by the subject of a distinction between his own inner life and what is other than, or extraneous to, that life. So, again, and for a similar reason, the intra-organic muscular presentations come to be closely associated with the train of feelings, thoughts, and impulses constituting the content of our consciousness of self, and as the invariable precursors of bodily movement, they naturally tend to awaken memory-images of such movement,—a circumstance of no small significance in this particular reference. I cannot here pursue the matter further, but perhaps I have said enough to indicate why I conceive the demand that it should be shown how the advance is made from the "activity of consciousness" to the "consciousness of activity" may be met by the counter-demand to establish a case for supposing there is any such advance at all,—for supposing, that is to say, that the term "activity" in these two phrases really denotes the same fact, and indeed for supposing that the activity referred to in the latter of them is, in truth, *mental* activity. All this is so

constantly taken for granted, and the crucial problem involved is so often not so much as recognised, that a plea for excessive care in handling the notion "act of consciousness" is surely not uncalled for.

If, then, from the connotation of the term "mental act" the implication of agency, in the ordinary sense of force or energy, be excluded, why, it may be asked, speak of a mental state or occurrence as an "act" at all? I can only indicate in the briefest way the reply I should make. A state of mind may, I think, legitimately be called an "act" in virtue of its essential character as a mode of discriminating and comparing. Whilst bearing, so far as one can discover, no analogy to an exercise of force or a putting forth of energy, to discriminate and compare does involve a process taking place, a change occurring, due in part, at least, to the intrinsic nature of consciousness itself. And in opposition to certain prevalent modes of looking upon conscious experience, it is not unimportant to emphasise this essential characteristic. The function of consciousness may readily enough be carelessly conceived as that of representing, somewhat after the fashion of a mirror, the real order of things, and, especially in dealing with cognition, the notion of passive receptivity is apt to encroach upon our psychological analysis in a variety of unsuspected ways. Even though we have discarded the view of sensations as "impressions," or "affections of the mind," we are liable, for example, to picture consciousness as standing face to face with, and as thus simply knowing, its object. The term "act" seems to me to be of service rather negatively to exclude misconceptions (as I take them to be) of this sort, than positively to clear up the nature of what we call consciousness. If it help to dispel the idea of awareness being merely a given fact, and to indicate that, on the contrary, awareness is a result depending on many conditions, not the least essential being those involved in the mental process itself, the employment of the term serves a useful purpose.

Mr. Moore and I differ as to the nature of a mental act, and the difference comes to the surface with respect to a further contention of his, on which apparently he lays considerable stress. "Of my own mental acts," he writes, "I am very often conscious in that direct manner in which I am conscious of a colour when I actually see it." The position thus clearly expressed is one that is widely held, but I have never been able to persuade myself that it is a tenable position. And what Mr. Moore says in support of it does not convince me. In the first place, I stumble over the word "direct." "By 'direct knowledge,'" we are told, "is here meant the kind of relation which we have to a colour, when we actually see it, or to a sound when we actually hear it." Now, when I actually see a colour, the colour and my awareness of it are, according to Mr. Moore, essentially distinct; the colour is either an appearance of a mental operation which is not aware of itself as giving rise to the appearance, or it is a quality of a physical object, and the awareness of the colour is an act which has nothing to do with constituting the colour. When, however, I am directly aware of my own mental act, then, it would seem, I have an experience in which there is no distinction between my awareness and that of which I am aware. It is difficult, therefore, to understand how the kind of relation can be similar in the two cases, and if in both the knowledge is direct, one wonders how it can be direct *in the same sense*. In the second place, I wholly doubt whether there is *any* sense in which it is true as a psychological fact that our knowledge of mental acts is direct. Were there no other grounds for the doubt, I should be content to rest it on the baffling want of agreement amongst even trained psychological observers as to *what* it is in regard to mental acts that *is* known in a direct, and therefore presumably certain, manner. From Mr. Moore's description of them, one would gather that mental acts as mental acts present very much the same characteristics in different persons. How comes it, then, if

each person is conscious of his own mental acts in a similarly direct way as that in which he is conscious of a colour, there is such widespread unanimity as to the characteristics of the colour, and such chaotic discrepancy as to the characteristics of a mental act? In the third place, there are, I think, positive reasons against the possibility of the alleged direct knowledge. If an act of consciousness be essentially an act of discriminating, direct awareness, on the part of the act itself, of its own discriminating seems to me to be precluded. For in that case the essence of an act of consciousness consists in discriminating something that is other than the act; one and the same act cannot, therefore, be *at once* a discriminating (say) of a colour *and* a discriminating of the discriminating of a colour. In order to save the situation, it would be necessary, at any rate, to maintain that the latter—the discriminating of the colour—was the object of another act of discriminating. But the contention that one act of mind can directly discriminate the discriminating activity of another act of mind would amount virtually to a resuscitation of the Kantian doctrine of an “inner sense” with many of the old difficulties unremoved, and with not a few new ones added. Not only is there no evidence whatsoever of any means of apprehending mental states that bears the slightest analogy to a “sense,” but an act of consciousness, however it be interpreted, has, I should have thought, none of the simplicity that characterises either a colour or a sound, and would require, therefore, for its apprehension an elaborate exercise of reflective understanding. With respect to the whole matter there are, I am convinced, a variety of circumstances that tend to obscure and confuse the issue. No distinction is more clearly recognised in mature experience than that, for example, between seeing and that which is seen (say, a specific colour). But (*a*) the distinction need by no means be,—I think certainly is not,—a distinction which in the form in which it is familiar to us would make its appearance in a primitive mental life;

(b) although the awareness of the seeing may appear to us in our mature experience to be direct and immediate awareness, it does not, in the least, follow that it is so as a matter of fact, for repeatedly what appears to be direct and immediate apprehension of something can be shown to be in truth indirect and mediate; (c) the apparently direct apprehension of the seeing may not, and so far as I can discover does not, disclose to us the real nature of the process of seeing. Save for the quite general description of it as a mode of awareness, Mr. Moore himself has no report to give of *what* it is, in regard to the seeing, he has directly and immediately observed. Are we to suppose that the actual process of seeing is as devoid of characteristics as is the seeing which we suppose ourselves to observe and which we are in the habit of distinguishing from that which is seen? It would be strange, indeed, if it were so. The probability is that there is a similarity here to what happens in regard to the physiological processes likewise concerned in mediating the experiences of the mental life. We are dimly, vaguely, conscious of something taking place in the bodily organism, and this consciousness, such as it is, appears to be direct and immediate, yet it conveys no information whatsoever about the nature of the processes in question. In visual apprehension, we are not aware of the image on the retina, nor of the rods and cones, nor of the optic nerve and its changes, nor of the occurrences in the cerebral centres. In like manner, it may well be the fact that psychical processes, correspondingly intricate, mediate the awareness of a coloured object,—psychical processes, the nature of which is no more revealed to the mind they help to constitute than is the nature of the physiological processes that take place contemporaneously with them.

A further question may be raised as to that aspect of conscious experience it has become customary to call feeling-tone. Is a feeling, in this sense, properly described as an "act of consciousness"? Mr. Moore would reply apparently in the affirmative. The question calls up a crowd of difficulties,

and I am very far from wishing to dogmatise. But, as at present advised, I hesitate in expressing concurrence with the affirmative answer. The feeling attitude exhibits peculiarities in virtue of which it may be broadly contrasted with acts of cognition or of conation. In the mature mental life, feeling is emphatically the personal or subjective element of our experience. An agreeable or disagreeable feeling appears to be rather a way in which we experience than something of which we have experience. As subjective in this sense, feeling can scarcely be said to constitute knowledge; we can hardly be said to *apprehend* in and through feeling. And, although I think we should assuredly be wrong in supposing that feelings and the contents of presentations are *ab initio* distinguishable by the conscious subject, yet the foundation for the discrimination between the subjective inner life and the objective world of external reality must be laid by simple and ultimate marks of the experiences included under the term feeling. Moreover, the feelings seem to be invariably conjoined with acts of cognition or conation, and to be in a peculiarly intimate way dependent upon them. So that there appear good grounds for holding (as Witasek does hold) that, whilst feeling is invariably connected with a content, yet feeling itself is never the bearer of such content, but that the content with which feeling is connected is the content of the act of apprehension in conjunction with which the feeling makes its appearance. If this be so, all we know of objects we should know through the process of apprehension; the object to which a feeling attaches itself would be the object of the act of apprehension which the said feeling accompanies or tones. And in that case, a feeling would scarcely be called an "act of consciousness" in the sense in which the phrase has been used with regard to cognition and conation. Indeed, I observe Mr. Moore himself in one place (p. 49) speaks of "that which distinguishes the being pleased with an object from the mere apprehension of the same object without being pleased with

it" as an internal or qualitative difference between the mental acts in question, and it is, I apprehend, at least a possible view that feeling, in all its forms as affective tone, is a qualitative characteristic of mental acts which, in essence, are acts of apprehension.

This leads me to refer to one other point, also of excessive difficulty. Leaving now feeling-tone out of account, what other internal qualitative difference can be constituted between mental acts? On the one hand, Mr. Moore concludes that "the difference which merely consists in the fact that one act of consciousness is a consciousness *of* one entity, whereas another act of consciousness is a consciousness *of* a different entity," is not itself a mental difference. My hearing a sound differs from my seeing a colour, in respect of the fact that when I hear a sound I am conscious of a different entity from that of which I am conscious when I see a colour, but as an act of consciousness the hearing, he would say, probably does not differ qualitatively from the seeing. If mental acts be treated in this way, in abstraction from their objects, then I agree with Mr. Moore it is well-nigh impossible to fix upon any feature wherein as acts they differ. Yet the very statement of the position is enough to awaken the thought of its extreme improbability. There is, I suppose, a correlation of some sort between the sensory mechanism of the body and the mental life of the individual subject; and that there should be elaborately differentiated organs of sense subserving, each of them, specific physiological functions, whilst the acts of consciousness that result from, or are concomitant with, (say) auditory and visual stimulation should, as a matter of fact, be qualitatively alike seems hardly a tenable hypothesis. Whoever adopts it will find himself driven, I should imagine, to the conclusion that sense-data are undoubtedly mental entities. On the other hand, Mr. Moore is convinced that some mental acts do differ qualitatively from others,—that there is an internal difference between, for example, the mental acts of merely thinking of a given pro-

position and believing it, or the mental acts of merely thinking of a future action, and willing that action. I do not question the qualitative difference. I would, however, insist that in these instances we are dealing not with single elementary acts of mind, but with exceedingly complex mental processes, and that the qualitative difference here in question is in large measure, at all events, due to the variety of the component factors that go to constitute the function we are apt to look upon as a specific power or faculty with marks or characteristics of its own. Consider, for example, the attitude of mind which Mr. Moore calls belief, and which, following the tradition of Brentano, he is inclined to differentiate so sharply from perceiving or thinking. I am not in the least concerned to dispute that the distinction between the mere awareness of an object and the judgment that the object exists, or between the mere thought of a given proposition and the assurance of its truth, is a clear and important distinction. I conceive it, however, to be as certain as anything psychologically can be, that that distinction is one which comes about gradually in the history of conscious experience, and that it is only to be met with at a comparatively advanced stage of mental development. I do not think we are entitled to suppose that, in the order of genesis, there is first apprehension of an object *simpliciter*, and later the determination of it as existent or non-existent; that there is first the mere thinking of a given proposition, and later the assurance of its truth or falsity. Rather our separation of the idea of an object from the actual object, or our separation of the mere thinking of a proposition from the assurance of its truth or falsity—our contemplation of the idea or the proposition in and for itself—seems to me to be the result of conceptual thinking, and to presuppose a prior recognition of the distinction between the real and the imaginary—a prior recognition, that is to say, of the distinction, in its rudimentary form, between truth and falsity. I do not know whether Mr. Moore

would assert of "mere thinking" and "believing" what Brentano maintained of *vorstellen* and *urtheilen*, that they are two fundamentally different modes of the consciousness of an object (*zwei grundverschiedene Weisen des Bewusstseins von einem Gegenstande*), or whether in his view the distinction between them is "ultimate and primordial," as J. S. Mill declared the distinction between "thinking of a reality" and "representing to ourselves an imaginary picture" to be. To me, at any rate, the weight of psychological evidence seems decidedly on the other side. In the complex state of mind called belief, I find no factor that can be said to appear there for the first time. Belief involves undoubtedly presentation, imagination, and reasoning. Not less surely are there included in it elements of feeling and conation. One can understand, therefore, why some psychologists should describe it as a purely intellectual act, others as a mode of feeling, others again as a form of conation. There is a certain amount of truth in all these modes of regarding it. But that which is distinctively peculiar to the attitude of belief must be sought, I think, rather in the way in which these factors are severally implicated than in any fundamentally unique qualitative feature. The reference to objective fact, characteristic of belief, has had, I conceive, its history, and even in mature experience varies considerably with the conditions on which it is dependent. I cannot, therefore, ascribe that reference to a special function of mind, the activity of which is called forth by presentations or ideas in themselves devoid of such reference. I add only one further remark in respect to the internal difference of such mental processes as those mentioned by Mr. Moore. Whilst I agree with him that the acts in question almost certainly do differ internally as acts, I imagine that much of what he might describe as internal difference I should put down rather to difference of content. For it is, I take it, chiefly, if not wholly, through difference of content that we are enabled to distinguish one mental act from another.

IV.

"Psychology has a special subject-matter of its own, and this special subject-matter may be defined by saying that it consists of all those among the contents of the universe, and those only, which are 'mental' or 'psychical' in their nature."

The outcome of Mr. Moore's investigation, so far as its bearing upon the science of psychology is concerned, is, it must be confessed, to leave us in an awkward situation. One conclusion only appears to be certain. Acts of consciousness, with such internal differences as they possess, their relations to one another, their modes of uniting to form groups or series—these, at any rate, are subject-matter of a distinct and specific science. Psychology, however, as actually pursued, has never yet been confined to these. Hitherto, what Mr. Moore describes as sense-data have invariably been regarded as subject-matter of psychology, and the treatment of them, in some form or another, has constituted the major part of the work to which the psychologist has devoted himself. Professor Ward expresses, in a couple of well-known sentences, the ordinary view. "As presented," he says, "to an individual, the 'whole choir of heaven and furniture of earth' may belong to psychology. The problem of psychology, in dealing with this complex subject-matter, is in general—first, to ascertain its constituent elements, and, secondly, to ascertain and explain the laws of their combination and interaction." Mr. Moore's demarcation of territory is radically different. He is not sure whether *any* of the "choir of heaven and furniture of earth" belongs to psychology. That depends, so I imagine he would tell us, upon the nature of sense-data. But, unhappily, we are, he thinks, in the predicament of not being able to determine whether sense-data are mental or not. Pending, then, the settlement of that point—and the prospect of settling it is hardly represented as hopeful—what is the unfortunate psycho-

logist to do? His treatment even of the subject-matter which, as Mr. Moore insists, undoubtedly does fall to his province cannot really be uninfluenced by the attitude he adopts towards the important question he is told he has, at all events, at present, no means of answering. The relation of acts of consciousness to sense-data that were mental would be very different from their relation to sense-data that were not mental, and the psychologist who was in suspense about the relation would very soon find himself at a stand so far as acts of consciousness were concerned. One regrets much that Mr. Moore has not given us some indication of how, under the circumstances, he considers psychological work is to be done, and, indeed, what precisely he conceives the psychological problem in reference, for example, to the facts of perception, memory, and imagination, to be.

With admirable precision and lucidity, Mr. Moore has drawn and vindicated the distinction between an act of consciousness and that of which through an act of consciousness there is awareness. The clear recognition of that distinction is, I am convinced, an essential requisite for the successful handling of psychological problems, and in view of the prevalence, in one form or another, of "Presentationism" in psychology, I welcome Mr. Moore's emphatic insistence upon this crucial point. The psychologist who has once realised the import of the distinction will find himself, I imagine, absolutely debarred from forming any such conception of the function of his science as that of which in recent years Münsterberg has probably been the chief exponent. Consciousness, from the psychological standpoint, means, according to Münsterberg, only the general condition for the existence of psychical objects or contents; all variations of consciousness are variations of content, which must be analysed without remainder into elements that are theoretically co-ordinated with the elements of presentations, that is, with sensations; presentations and their elements alone can find a logically

satisfactory description in psychology. So conceived psychology is, it is true, held to be from the necessity of the case an abstract and purely descriptive science; the inner life that forms the object of its treatment is avowedly not the actual inner life, but an artificial reconstruction made by scientific thought for the purpose of grasping a group of psychical phenomena as a causal system. The subject-matter of psychology consists, that is to say, of contents of consciousness, considered in abstraction from consciousness; and these, it is maintained, can be dealt with as objects, and be resolved, as physical objects can be resolved, into their elementary components. But to attempt to build up a science of mind by first of all eliminating from its province the distinctive characteristic of mind is surely to court disaster at the start. Contents, so regarded, become just things, and the *apprehension* of things has been in no way brought within the scope of scientific treatment by the mere device of describing such things as psychical. To repeat a contention already insisted upon, they are certainly not psychical in the sense in which the apprehension of them is psychical. A single illustration will perhaps make my meaning clear. Suppose it be said that one idea is suggested by, and tends to combine with, another which resembles it. Then, even, though it be assumed that that similarity is able to act as a force and to bring together two ideas,—an assumption I find it hopeless to try to understand,—yet the problem of how there comes to be *recognition* of similarity or resemblance in what is in such a case apprehended has not been thereby so much as remotely touched. As against presentationism, I am, then, entirely at one with Mr. Moore in holding that the distinction between an act of consciousness and that of which there is consciousness is a distinction which the psychologist can neglect only at the cost of entirely misconstruing the facts with which he is called upon to deal. But distinction does not necessarily imply complete separation, and in sharply severing, as he

appears to do, the act of apprehension from what is apprehended, Mr. Moore falls, I think, into an error which is, in a sense, the counterpart of that exemplified in presentationism. If acts of consciousness be conceived as not differing in respect to their different objects, but as differing only internally in the way indicated by Mr. Moore, then little else would seem to be left for psychologists to do than to arrange these acts under their respective headings,—to treat each act, that is to say, as a mode of exercise of one of the specific "powers" or "faculties" with which, in that case, the mind must be held to be endowed. I know not how far Mr. Moore is in sympathy with the attempt "to reinstate the old faculty psychology,"* but that I should imagine to be the outcome of the line of reflexion pursued by him in respect to mental acts. The reinstatement would mean, I am persuaded, the abandonment of psychology as a scientific pursuit. Admittedly, the doctrine of faculties has no explanatory worth. "Much," however, it is contended, "is perfectly intelligible which is not explicable."† But how is a mental process made intelligible by referring it to a faculty? The faculty is only a repetition in a single word, and in the very abstract notion of a "power," of the facts that are being dealt with, and if these are not intelligible in themselves, they certainly do not become intelligible by being attributed to a faculty; the notion of the faculty is just abstracted from the special facts which it is supposed to render intelligible. Moreover, on four specific grounds, a faculty psychology would, I submit, be unscientific: (a) characteristic differences would be taken to be simple, when in truth they were very much the reverse; (b) a simplicity would be assumed in the cause or condition of a type of "mental energy" entirely out of harmony with the complexity of the effects it would be thought to

* H. A. Prichard, "A Criticism of the Psychologists' Treatment of Knowledge," *Mind*, N.S., Vol. XVI, p. 53.

† *Ibid.*, p. 52.

produce; (*c*) the intricate fashion in which the various processes of the mental life are interwoven would have no justice done to it; (*d*) the part played by development in the mental life would inevitably fail to secure due recognition.

As contrasted, then, with each of the two points of view just referred to, the three-fold distinction of act, content and object provides, it seems to me, a basis for psychology as a scientific study of the concrete facts of mind. Neither contents taken in abstraction nor acts taken in abstraction are the real components of the actual mental life, but acts whose function consists in discriminating features of the real world, and whose nature is partially determined by the features which through them are discriminated and, as discriminated, are held, if one may so express it, in the awareness that thereupon ensues. In other words, presentations apart from the acts of which they are contents would be blind; acts apart from presentations as their contents would be empty. As subject-matter of psychology there is thus retained all that is truly essential in presentationism on the one hand, and in the view of consciousness as a series of acts or processes on the other, but no fictitious independence is ascribed to presentations, and no baffling uniformity of character is ascribed to acts of consciousness. Moreover, the interconnectedness, the relatedness, of the processes of the mental life can be interpreted in a satisfactory way. Mr. Moore himself recognises the difficulty of rendering any account, for example, of the familiar facts of association and suggestion, if no difference of content be admitted between the consciousness of one object and the consciousness of another. He thinks it possible, however, that the effect may be produced neither by the object nor by the act of consciousness, but by the whole fact—the fact that I am conscious of the object. I am wholly at a loss to see how. No doubt “the whole fact—the fact that I am conscious of one object—is always different from the fact that I am conscious of another object.” But *ex hypothesi* the difference

still lies solely on the side of the objects, and if the *consciousness* of A is exactly similar to the *consciousness* of B, and if the different effects are not produced by the different objects, then what can there be in the whole fact, *the consciousness of A*, to give rise (say) to the consciousness of X, that is wanting in the whole fact, *the consciousness of B*, which consequently is not able to give rise to the consciousness of X? It must be, one would have thought, a difference of *awareness* that is in question here, and on the view I am taking, the problem—typical, it seems to me, so far as the particular aspect of it now under consideration is concerned, of the majority of problems respecting the mental life—occasions no such crucial difficulty as that which Mr. Moore has to encounter. Difficulties in abundance unquestionably remain, but I do not find them to be of an insuperable kind. The objection made, for example, by Titchener* can scarcely be reckoned a strong one. If, he argues, in every type of conscious process, act and content are distinguished, one has to duplicate one's psychology; "everything must be treated twice over, from the point of view of act, and from the point of view of content." I fail to discern the alleged necessity. What we are dealing with throughout are complicated mental processes,—processes which, as I have tried to show, cannot be properly treated from the point of view of act alone, or from the point of view of content alone. Both aspects have at every stage to be taken into account, and, since the aspects are essentially different, duplication one would have imagined to be the last thing likely to happen. Further, Titchener complains that what he calls the duplication of treatment leads both to over-articulation and to neglect of analysis. He instances, by way of illustration, Witasek's account of judgment, and the elaborate distinction drawn by Witasek not only between act,

* E. B. Titchener, *Lectures on the Experimental Psychology of the Thought-Process*, N.Y., Macmillan, 1909, p. 56 *sqq.*

content, and object of presentation, but between the two-fold act and quasi-content of judgment. As directed against Witasek, the charge of over-articulation is not, perhaps, without foundation.* But the over-articulation is surely due not to the distinction between act, content, and object, but to the arbitrary severance which Witasek, following Brentano, institutes between presentation and judgment. That severance, however, is one which I have tried to give grounds for thinking the distinction in question ought and does enable us to avoid.

If the line of thought along which I have been proceeding be in principle sound, it follows that the subject-matter of psychology cannot be defined by saying that it consists only of entities that are mental or psychical in their nature. Contents of consciousness, conceived in the manner I have been endeavouring to make clear, would still be what Mr. Moore calls "entities," but, with the possible exception of such of them as arise from introspection of the mind itself, they would not, as I have already insisted, be rightly described as mental entities. They are dependent, it is true, *quod* contents, upon the apprehending mind; but they are dependent, so far as their qualitative character is concerned, upon the external world of fact, in interconnexion with which the life of mind is lived and undergoes development. Yet they, obviously I should say, form part of the subject-matter of psychology. They are the modes of the mind's participation in that which is other than itself, and they are equally the ways in which, through such participation, the mind is a mind at all. A plurality of related contents held together in an act of awareness constitutes, it may be said, the unit of the concrete life of consciousness. And what gives to the act of awareness its concreteness and definiteness, what enables its character as an act to be dealt with and described, is just the variety of content with which it

* Professor Mitchell in his able work, *Structure and Growth of the Mind*, Macmillan, 1907, p. 216, takes exception to Witasek's analysis for a similar reason.

is connected. It is impossible, therefore, that the act should form part of the subject-matter of psychology whilst its content does not. Those contents, then, which Mr. Moore calls sense-data, the psychologist has rightly regarded, according to the view I have been taking of them, as falling within his province. Even though they be not mental entities, yet they are factors in the development of mind—mind, at all events, as we know it—no less essential than those entities about whose mental character there can be no doubt. The view of psychology as having its subject-matter restricted to entities that are mental in character is based, then, so I venture to urge, upon a mistaken conception of the nature of the mind and of its modes of operation. That nothing can enter into the life of mind and become a factor in its development which is not, in essence, akin to the essence of mind as an existing reality is, in truth, a tremendous assumption, and an assumption, I am convinced, which, in the attempt to work out a philosophical realism, we shall have once for all to discard. "We forget," says Adamson "that mind is not an abstraction, that it lives only in and through its concrete expression, and that what we represent as the product of mind might just as fairly be said to be the very making of mind."* Accordingly, whatsoever enters into the life of mind may, it seems to me, legitimately be regarded as part of the subject-matter of psychology. And if it be true that those contents of consciousness which are the ways in which the external world is known are not mental in character, then, in including them, as, in a sense, products of mind, within the province of psychology, we are in fact beginning to do from the start what is ostensibly being done in those departments of research that have recently branched out from what used to be considered as alone the domain of the psychologist. By observation of what may be called collectively the products or the expressions of the mental life

* *Development of Modern Philosophy*, Vol. II, p. 18.

(including therein all that falls within the wide range of human culture), psychologists have been throwing new light upon the constitution of the individual consciousness and the various stages of its evolution. By a comparative study of the forms of religious beliefs or of the forms of political institutions, they have, for example, been enabled to gain deeper insight into the general character of the order of change in mental development. So, again, by the comparative study of the different forms, earlier and later, of human language they have been still more closely brought into contact with the ways in which intelligence grows and widens. In short, it seems to me inevitable, from the very nature of mind and its function as apprehensive of reality, that in the subject-matter of a science of mind very much must be included beyond the entities which can be described as mental entities. And for this reason, one must admit, I think, the force of Professor Ward's contention that psychology is more accurately defined by the standpoint from which experience is viewed than by reference to a special subject-matter.

ABSTRACT OF THE MINUTES OF THE PROCEEDINGS
OF THE ARISTOTELIAN SOCIETY FOR THE
THIRTY-FIRST SESSION.

November 1st, 1909. Mr. S. Alexander, President, in the Chair.—
Prof. W. Wundt was unanimously elected a Corresponding
Member. The President delivered the inaugural address on
"Sensations and Images." A discussion followed, in which the
following members took part: Mr. S. H. Hodgson, Mr. Childs,
Mr. Benecke, Mr. Nunn, Mr. Carr, Mr. Foston, Mr. Waterlow,
Miss Oakeley, Mr. Dumville. The President replied.

December 6th, 1909. Mr. S. H. Hodgson, V.P., in the Chair.—
Mr. G. E. Moore read a paper on "The Subject-Matter of
Psychology." The discussion was opened by Mr. G. Dawes
Hicks. The Chairman and Mr. Wolf, Mr. B. Russell, Mr.
Dumville, and others took part, and Mr. Moore replied.

January 3rd, 1910. Mr. G. E. Moore, V.P., in the Chair.—
Mr. William Brown read a paper on "Epistemological
Difficulties in Psychology." A discussion followed, in which
the Chairman and Messrs. Hodgson, Dawes Hicks, Caldecott,
Brough, Dumville, Goldsbrough, and others took part, and
Mr. Brown replied.

February 7th, 1910. Mr. Shadworth H. Hodgson, V.P., in the
Chair.—Mr. A. D. Lindsay read a paper on "Kant's Account
of Causation." A discussion followed, in which the Chairman,
Mr. Benecke, Mr. Nunn, Mr. Carr, and others took part.
Mr. Lindsay replied.

March 7th, 1910. Mr. Shadworth H. Hodgson, V.P., in the Chair.
—M. Henri Bergson was unanimously elected a Corresponding
Member. Mr. G. Dawes Hicks read a paper on "Mr. G. E.
Moore on 'The Subject-Matter of Psychology.'" Mr. G. E.
Moore replied, and a general discussion followed, in which the
Chairman and Messrs. Carr, Wolf, Dumville, Lynch, Childs
and others took part.

April 4th, 1910. Mr. G. Dawes Hicks, V.P., in the Chair.—Sir Francis Younghusband, Prof. C. Lloyd Morgan, Miss Beatrice Edgell, Miss F. R. Shields, Prof. S. W. Green, and Miss Saida James were elected members. Mr. H. Wildon Carr read a paper, "Bergson's Theory of Instinct." A discussion followed, in which the Chairman and Mr. Hodgson, Mr. Benecke, Mr. Nunn, Mr. Wolf, Mr. Dumville, and Miss Oakeley took part.

May 2nd, 1910. Mr. A. Caldecott in the Chair.—Mr. E. C. Childs read a paper on "Logic and Science." A discussion followed; in which Messrs. Benecke, Lynch, E. T. Dixon, S. H. Hodgson, Dumville, Carr, Sadow-Pittard, Goldsbrough, and others took part. Mr. Childs replied.

June 6th, 1910. Mr. G. E. Moore, V.P., in the Chair.—Mr. T. E. Hulme, Mr. D. L. Murray, and Dr. H. de Sadow-Pittard were elected members. Mr. Sydney Waterlow read a paper on "The Philosophical Implications of Mr. Bertrand Russell's Logical Theory of Mathematics." A discussion followed, in which Mr. Bertrand Russell, Mr. S. H. Hodgson, Mr. Benecke, Mr. Dixon, Mr. Lynch, Mr. Carr, and others took part.

July 4th, 1910. Mr. Shadworth H. Hodgson, V.P., in the Chair. The Report of the Executive Committee and the financial statement were adopted. A ballot was taken for the election of officers for the ensuing session, and the following were elected:—President, Prof. Alexander; Vice-Presidents, Prof. G. Dawes Hicks, Mr. G. E. Moore, and Prof. W. R. Sorley; Treasurer, Dr. T. P. Nunn; and Honorary Secretary, Mr. H. W. Carr. A proposal by Mr. Carr that the Society should undertake the preparation of a Dictionary of philosophical terms in present use was discussed and the consideration adjourned.

JOINT MEETINGS OF THE ARISTOTELIAN SOCIETY
THE BRITISH PSYCHOLOGICAL SOCIETY, AND THE
MIND ASSOCIATION.

Friday, June 24th.

At 22, Albemarle Street, at 4 o'clock. Prof. Carveth Read in the Chair.—A Symposium on "Instinct and Intelligence," by C. S. Myers, C. Lloyd Morgan, H. Wildon Carr, G. F. Stout, and Wm. MacDougall was discussed. The papers, which had been already sent to members, were taken as read. The discussion was opened by the writers of the papers, following the order in which the papers had been written. Mr. E. T. Dixon, Mr. B. Dumville, Prof. Sorley, Prof. Alexander, and the Chairman took part. Mr. MacDougall, Prof. Lloyd Morgan, and Dr. C. S. Myers replied.

At the Criterion Restaurant, at 8 o'clock, Members of the Societies dined together. Prof. W. R. Sorley was in the Chair.—There were 51 present. The Chairman proposed the Toast of the three Societies. Speeches in reply were made by Prof. Alexander, Prof. Carveth Read, Dr. Schiller, Mr. Shadworth Hodgson, and Mr. H. Wildon Carr. The health of the Chairman was proposed by Prof. Adams.

Saturday, June 25th.

At 22, Albemarle Street, at 11 o'clock. Prof. Alexander in the Chair.—A discussion on "Are Secondary Qualities independent of Perception?" was opened by Dr. Nunn and Dr. Schiller, whose papers previously sent to members were taken as read. Prof. Stout, Dr. Bosanquet, Dr. Goldsbrough, Mr. Underhill, and the Chairman spoke, and Dr. Schiller and Dr. Nunn replied.

At 3 o'clock. Prof. G. Dawes Hicks in the Chair.—Mr. W. H. Winch read a paper on "The 'Faculty' Doctrine: Outlines of

some Experiments on School Children in Relation to this Doctrine." The experiments were criticised by Mr. Wm. Brown, Mr. MacDougall, and Mr. W. G. Sleight and defended by the writer. Mr. E. Bullough read a paper on "Some Observations on the *Æsthetic* Appreciation of Colour Combinations," which he illustrated with blackboard demonstrations. Mr. MacDougall and Mr. Wm. Brown discussed the experiments, and Mr. Bullough replied. The Chairman then read a paper on "The Nature and Development of Attention." Mr. Carr took the Chair while the paper was under discussion. Messrs. Stout, Alexander, Sorley, and MacDougall took part in the discussion, and Dr. Hicks replied. Mr. Bernard Bosanquet proposed a vote of thanks to Mr. Carr for the work he had done in organising the conference. Mr. Carr responded, and the meeting closed.

FINANCIAL STATEMENT—31st SESSION, 1909-1910.

RECEIPTS.			EXPENDITURE.		
	£	s. d.		£	s. d.
Balance brought forward from last Session	Royal Asiatic Society, for use of rooms
Members' subscriptions—					
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Arrears..	7	7 0	<i>Proceedings</i> , Vol. IX..
In advance	6	6 0	Proofs of Papers sent out, Notices of Meetings, etc.	21	2 0
	87	3 0			
Sales of <i>Proceedings</i> (net)—			Gratuities to Attendants	..	..
Six months to December 31, 1908	5	12 11	Advertisement in <i>The Times</i>	..	..
" June 30, 1909	12	19 7	Receipt book	..	..
	18	12 6	Treasurer's postage (1908-9)	..	..
Interest on Post Office Deposit Account	..	..	Bank charges, etc.	..	..
	1	0 0	Balance in hand—	..	..
			On Deposit in Post Office Savings Bank	41	3 11
			At London Joint Stock Bank	124	6 4
				165	10 3
				<u>£270</u>	<u>11 6</u>

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Examined and found correct June 24, 1910—

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RULES OF THE ARISTOTELIAN SOCIETY.

NAME.

I.—This Society shall be called “THE ARISTOTELIAN SOCIETY FOR THE SYSTEMATIC STUDY OF PHILOSOPHY,” or, for a short title, “THE ARISTOTELIAN SOCIETY.”

OBJECTS.

II.—The object of this Society shall be the systematic study of Philosophy; 1st, as to its historic development; 2nd, as to its methods and problems.

CONSTITUTION.

III.—This Society shall consist of a President, Vice-Presidents, a Treasurer, a Secretary, and Members. The Officers shall constitute an Executive Committee. Every Ex-President shall be a Vice-President.

SUBSCRIPTION.

IV.—The annual subscription shall be one guinea, due at the first meeting in each session.

ADMISSION OF MEMBERS.

V.—Any person desirous of becoming a member of the ARISTOTELIAN SOCIETY shall apply to the Secretary or other officer of the Society, who shall lay the application before the Executive Committee, and the Executive Committee, if they think fit, shall admit the candidate to membership.

CORRESPONDING MEMBERS.

VI.—Foreigners may be elected as corresponding members of the Society. They shall be nominated by the Executive Committee, and notice having been given at one ordinary meeting, their nomination shall be voted upon at the next meeting, when two-thirds of the votes cast shall be required for their election. Corresponding members shall not be liable to the annual subscription, and shall not vote.

ELECTION OF OFFICERS.

VII.—The President, three Vice-Presidents, Treasurer, and Secretary shall be elected by ballot at the last meeting in each session. Should a vacancy occur at any other time, the Society shall ballot at the earliest meeting to fill such vacancy, notice having been given to all the members.

SESSIONS AND MEETINGS.

VIII.—The ordinary meetings of the Society shall be on the first Monday in every month from November to June, unless otherwise ordered by the Committee. Such a course shall constitute a session. Special meetings may be ordered by resolution of the Society or shall be called by the President whenever requested in writing by four or more members.

BUSINESS OF SESSIONS.

IX.—At the last meeting in each session the Executive Committee shall report and the Treasurer shall make a financial statement, and present his accounts audited by two members appointed by the Society at a previous meeting.

BUSINESS OF MEETINGS.

X.—Except at the first meeting in each session, when the President or a Vice-President shall deliver an address, the study of Philosophy in both departments shall be pursued by means of discussion, so that every member may take an active part in the work of the Society.

PROCEEDINGS.

XI.—The Executive Committee are entrusted with the care of publishing or providing for the publication of a selection of the papers read each session before the Society.

BUSINESS RESOLUTIONS.

XII.—No resolution affecting the general conduct of the Society and not already provided for by Rule XIV shall be put unless notice has been given and the resolution read at the previous meeting, and unless a quorum of five members be present.

VISITORS.

XIII.—Visitors may be introduced to the meetings by members.

AMENDMENTS.

XIV.—Notices to amend these rules shall be in writing and must be signed by two members. Amendments must be announced at an ordinary meeting, and notice having been given to all the members, they shall be voted upon at the next ordinary meeting, when they shall not be carried unless two-thirds of the votes cast are in their favour.

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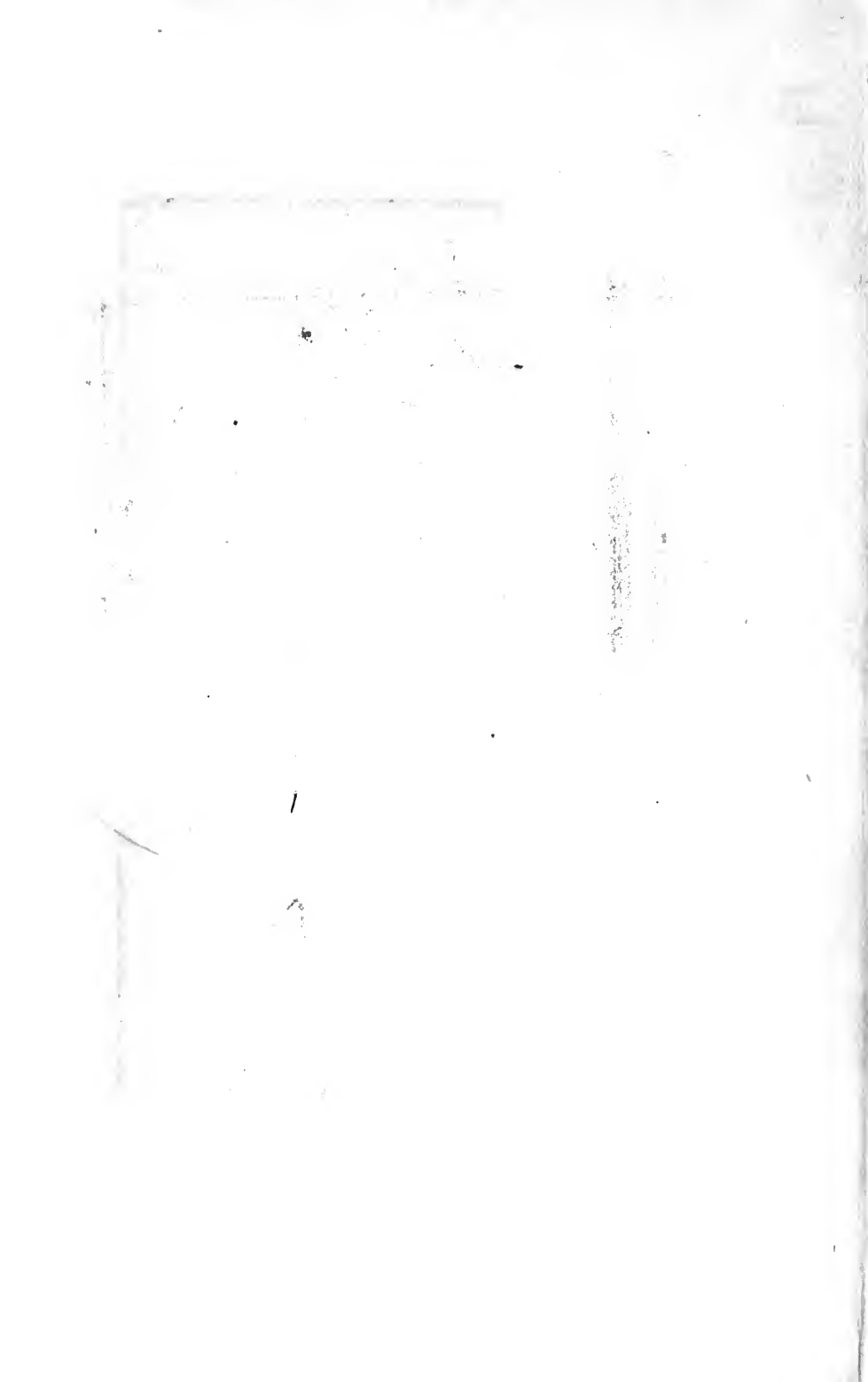
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